

GOVERNMENT OF INDIA  
DEPARTMENT OF ARCHAEOLOGY  
CENTRAL ARCHAEOLOGICAL  
LIBRARY

---

CLASS \_\_\_\_\_

CALL No 901.0985 Buy

D.G.A. 79.

DISTRIBUTED BY  
THE ENGLISH BOOK STORE  
7-11, Ann. Circus, New Delhi.



Finding Out About  
THE INCAS



*Also in this series:*

FINDING OUT ABOUT THE ATHENIANS

*Patrick Anderson*

FINDING OUT ABOUT IMPERIAL CHINA

*Professor C. P. Fitzgerald*

FINDING OUT ABOUT THE VIKINGS

*D. Phillips-Birt*

FINDING OUT ABOUT ANCIENT EGYPT

*H. E. L. Mellersh*

FINDING OUT ABOUT IMPERIAL ROME

*P. E. Cleator*

FINDING OUT ABOUT STONE AGE BRITAIN

*H. E. L. Mellersh*

FINDING OUT ABOUT THE BABYLONIANS

*E. Royston Pike*

EXPLORING THE PAST SERIES

*General Editor: Patrick Moore*

---

Finding Out About  
**THE INCAS**

296.46 by

COTTIE A. BURLAND

*Illustrated by*

ELIZABETH HAMMOND

901.0185  
Bur:

916.5  
Burl

FREDERICK MULLER LIMITED  
LONDON

FIRST PUBLISHED IN GREAT BRITAIN IN 1960 BY  
FREDERICK MULLER LIMITED

PRINTED AND BOUND IN GREAT BRITAIN BY  
THE GARDEN CITY PRESS LIMITED  
LEITCHWORTH, HERTFORDSHIRE



Copyright © 1960, *Cottie A. Burland*

CENTRAL ARCHAEOLOGICAL  
LIBRARY, NEW DELHI.

Acc. No ..... 29646.....  
Date ..... 3/6/61.....  
Call No ..... 901.0985/ *Bur.*.....

*The five photographs by Mervyn G. Palmer are reproduced by  
courtesy of the Trustees of the British Museum.*

## CONTENTS

1.	THE PEOPLE OF PERU . . . .	9
2.	BEFORE THE INCAS . . . .	22
3.	CENTRE OF GOLD . . . .	42
4.	TERRACES AND TOWNS . . . .	59
5.	THE ROAD AMONG THE NATIONS . .	70
6.	THE FISHERS OF THE GREAT OCEAN . .	86
7.	KNOTTED STRINGS AND PAINTED BOARDS .	99
8.	THE SACRED HUACAS . . . .	114
9.	THE END AND THE BEGINNING . . . .	128
	EPILOGUE . . . . .	140



## ILLUSTRATIONS IN THE TEXT

	<i>Page</i>
The Topa Inca and his Queen in festival dress	15
Inca period pottery	19
A fisherman on his canoe of totora reeds	30
A stone bowl of the Inca period with serpents symbolizing the earth	39
The mummy of a dead Topa Inca carried to his palace	47
The Topa Inca leads the young warriors at the Situa festival	55
Digging and storing the potato crop	62
A bridge on the mountain road of the Incas	72
The Topa Inca in his travelling litter	79
Llamas with loads ready for a journey	91
The Quipucamayoc with his records	100
Women weaving and working beside their homes	106
A stone bowl and ancient pots, all called Huacas by the Indian villagers	115
Architects examining stones for an observatory	122
The Peruvian villagers working in their fields	135

## PHOTOGRAPHS

	<i>between pages</i>
Quechua-speaking Indian children at Tampu Machay	48, 49
The ruins of the pleasure palace of Tampu Machay	48, 49
Woven shirt for a nobleman with typical Inca designs	48, 49
Wooden standing cup inlaid with a mastic picture	48, 49
Two wooden <i>kero</i> (beakers)	80, 81
An ancient quipu recording numbers running into tens of thousands	80, 81
Three Inca pottery vessels with similar painted designs	80, 81
Smaller Inca pottery: a "kettle" and a ladle	80, 81
The monolithic Intihuatana in the city of Macchu Pichu	112, 113
A stone marker on Ccolcampata where Inca youths competed	112, 113
Inca period stonework	112, 113
The Centre of the Earth: the walls of Ccoricancha	112, 113
Small pottery vase with flower painting and a puma head	112, 113

# I

## THE PEOPLE OF PERU

**G**OLD WAS the call of Peru, gold, gold, gold ! The adventurers sailed on the rumour of gold to be found in a mysterious kingdom on the coasts of the southern sea. They suffered incredible hardships, and in the end overthrew a mighty empire, winning for themselves the treasures of the Incas.

There are few adventure stories so strange as the history of the conquest of Peru by brave Pizarro; few histories so tragic as the civil war in which the conquerors fought among themselves. When it was all over and the Spanish Government had gained control over both conquerors and conquered, a few people, mostly of native descent, wrote the history of the country. By good fortune they have left us some record of the Inca family and of the customs of the Peruvian Indians over whom they ruled. These books, and the still impressive remains of ruined stone cities in the high Andes, together with hundreds of nicely made pots and textiles, are all that remain to us.

The stories are so strange that one wishes to find out what the Incas were really like. Who were these people, who ruled an empire as big as half of Europe? They wrote with knots in strings. They had no wheels



and no machines, only the llama to carry burdens for them. Their beautiful pottery was coiled by hand, without a potter's wheel. Their weaving was so rich and complicated that it was the envy of all who saw it, yet they had made it only on a simple back-strap loom. They irrigated the deserts and lined the mountain sides with terraces for growing food, but their tools were their hands and simple digging-sticks. They built palaces and temples of great stones weighing many tons, yet they had no metals for tools beyond a rather soft bronze. That human beings could do such great things with so little mechanical help is even more wonderful than the treasures which were discovered by the conquerors.

One can go to Peru to see the treasures in the museums, or climb the mountain roads to the ancient Inca capital Cuzco. We may even meet the descendants of the people who were ruled by the Incas, but the best way to actually visit the world of the Incas is to walk into one particular book. Copies of this book have been printed, but the original, written on ancient paper with a quill pen, is to be found in the Royal Library in Copenhagen. Here, in a fine modern library, over the garden which was once a dock for the wooden warships of olden days, one can see the book of Huaman Poma de Ayala, Hawk Puma of Ayala. At some time in the past it was presented by the Spanish Emperor to the King of Denmark; probably it was thought of as a wonderful curiosity. And indeed it is wonderful to think how this strange book, with its scratchy and vivid sketches, should have remained in

the great library until 1908 before it was realized just how important it was.

Huaman Poma drew his pictures on every other sheet of a book of nearly 1,200 pages. What he wrote is not new to science, but his drawings show the people of Inca Peru doing things and using tools. We see them dressed in their ancient costumes, just as if we were looking at sketches made the other day by a visitor from this strange land. For the first time we know exactly what the mysterious Llautu, the crown of the Incas, looked like. For the first time we know how the digging-stick, which they used instead of a plough, was really made and used. There in the book we can see the Incas and their wives, the great officers of state, the soldiers and peasants—all sketched by Hawk Puma of Ayala, who was a descendant of Inca princes.

Hawk Puma was the son of a great Indian nobleman who had been among the supporters of Huascar Inca, who was murdered by his half-brother Atahualpa just at the time when the Spaniards came first to Peru. Naturally he was ready to assist the Spanish invaders, because he reckoned that they had been sent by Viracocha, the supreme god, to punish the false Inca Atahualpa. After the conquest, this noble of the ancient Inca family became a Christian and was made a grandee by the Spaniards with the title Don Felipe. When his little son began to grow up, Don Felipe took him to all the famous places in the family history. He showed him the palaces and fortresses of the capital city Cuzco, and described the wonderful Ccoricancha temple where the sun god used to live. They went up

into the mountains to Tampu Tocco, where the ancestors of the Inca family had first come to Peru on the orders of their father the sun god. Sometimes Don Felipe was allowed to take his son into the houses where ancient boards were kept with the history of the Incas painted on them. Young Hawk Puma also saw the paintings made of the Spanish conquest. He must have loved these stories and pictures and kept them in his mind, for when he was a grown man and a clever lawyer, living in Spain, he wrote his book and drew the pictures he remembered of the ancient time, and added many others of people and things he had seen in far-away Peru. In 1616, when he was growing old, he presented the book to King Philip III of Spain. It had taken him from 1587 to 1613 to write it.

By the time that Huaman Poma's book had been identified in the Royal Library in Copenhagen, we were just beginning to realize that ancient Peruvian pottery showed many different styles which could not all have been made in one historical period. In other words, scientists were becoming convinced that Peruvian history might well extend for a thousand years before the first Inca. (Nowadays we know that there were skilled potters at work in Peru near Chavín two thousand years before the arrival of the Incas.) But with Huaman Poma's sketches to guide us, it became much more easy to identify some of the types of pots which were used in Inca times. By comparing these pots with others, it became clear that the Peruvians of the Inca homeland in the mountains had a special way of painting their pots. They preferred geometric

arrangements of lines, and even occasionally decorated a vase with painted flowers. Also the quality of their potting was much the finest in Peru. They made simple shapes such as the ones in Huaman Poma's sketches by moulding them from coils of clay, without a potter's wheel. They hardly ever used moulds for shaping their pots, even though people on the coasts of the Pacific were moulding almost all their pots at that period.

The comparison of pot designs, and the sketches of costume on Huaman Poma's drawings, enabled us to identify typical Inca patterns on ancient textiles, and so to give them a date.

In fact, the book was so important for study that the great French ethnologist Professor Paul Rivet decided to have a facsimile edition of it specially printed in 1923 for the Institute of Ethnology in Paris. It was then possible for the work of Huaman Poma de Ayala to be seen by people in any country of the world. Professor Rivet and Huaman Poma had joined hands in introducing the Incas as they really appeared in life. The book was a bridge over nearly four centuries.

The Indians we meet in the drawings are not very large people such as the American Indians of the prairie, but are smaller, about five feet six in height, slight in build but with wiry muscles. They lived and worked hard in the high plateaux of the Andes. Cuzco, the capital city, was more than nine thousand feet above sea level, and you can be sure that only strong and healthy people could live and work at such an altitude. Huaman Poma shows them as having a strange head shape. It is not bad drawing, but a true

record of fashion. Babies were put in their cradles with a little board resting lightly on their foreheads. It made the skull grow high at the back and flat in front. The people said they did this because it made it easier for them to wear a carrying-strap round their foreheads when they grew up. True enough, Huaman Poma drew grown-ups carrying heavy loads on their backs, held not by shoulder straps but by a broad band passing across the forehead of the carrier. But this was also the fashion, so even the Inca himself had his skull shaped in this way when a child. It could have done no harm to the brain inside, because some of these Incas were very brilliant men.

Naturally one expects the Inca family to have appeared somewhat different from the tribes over whom they ruled. But, for all their stories of a separate origin, their own faithful champion, Hawk Puma of Ayala, drew them exactly like the other Indians of Peru. As a matter of fact they had no conception of other types of human beings. There were stories of white-bearded men in the mythical past when the sacred city of Tiahuanaco was built; but until the Spaniards arrived, no Peruvian Indian had actually seen a white man.

The drawings show the members of the Inca family dressed like the other Indians, but with more decoration on their clothes. We have to turn to the chroniclers to understand this. They tell us that the Incas were dressed in "chumpi", a cloth made from the delicate wool of the wild vicuña, and that it was incomparably more delicate and beautiful than the cloth made from



The Topa Inca and his Queen the Ccoya in festival dress

the wool of the alpaca which ordinary people wore. Ordinary llama wool was too coarse to be normally used for weaving in Peru. These highlanders expected to wear only the best.

The Inca costume was very simple. Men wore garments resembling pantaloons drawn in above the knee. Over these they wore a tunic made out of two oblong pieces of cloth joined at sides and shoulders, rather like a sack with holes for arms and head. This was gathered in at the waist by a broad belt which went round the wearer two or three times.

The belt was very important to the Inca, because the coloured patterns woven on it showed his position in society. The Inca wore a belt with different patterns for every different ceremony which he performed. So it was for other men, right down to the simple farmers in the little plots of land on the mountain sides, who wore plain belts on ordinary days and brightly embroidered ones on festival days.

The farmers, and all people who worked hard in Inca Peru, wore sandals made of llama hide. The sandals had thick strong soles of several layers of leather, and were held in place by a thong, between the big toe and other toes, which looped into a strap going across the instep, with another ankle strap fixed to the back of the sandal. Young warriors of the Inca family wore special shoes which looked almost like gold. They were woven of a special grass which dried in this way. The chronicles tell us of the Inca himself wearing sandals of real gold, but Huaman Poma's drawings do not tell us anything about the material,

except that they were toe-strap sandals like all the other ones in Peru.

Ladies wore sandals of the same kind. Their long dresses were made like a broad sack, reaching from shoulders to ankles. This gown was usually made of plain material, decorated with bands of tapestry at neck and hem. They also wore wide tight belts, bound round the waist several times. On their heads they wore a piece of cloth, folded two or three times on top of the head and hanging down their back to just below their shoulders. When going out they often wore long wide cloaks, which were held together at the neck by large decorated pins of silver.

The Inca and his Queen, the Ccoya, were dressed in the same way as other people, but in the most gorgeous materials imaginable. The finest wools in the most vivid colours made their costumes appear as brilliant as the richest Chinese silks. All their ornaments were of sacred gold, for gold was the metal of the Sun. Only members of the Inca family might wear it, because they alone were the descendants of the sun god Inti. The head-cloth of the queen was of the purest white wool. The head-dress of the Inca was made of scarlet wool ribbons wound several times round his forehead; in the front of it he wore the sacred Llautu. On a short stick about six inches high there was a flat tassel of scarlet wool like a little banner, and above that two small feathers yellow in colour. These feathers came from a rare bird which lived only in one remote valley of the Andes. The Indians of Peru believed that the Creator made only one pair of these birds for each



Inca, so that the two feathers on the Llautu were really a gift to the Child of the Sun from the great Creator Viracocha himself. It was like this with many things in ancient Peru; the simplest object could be used as a symbol for an important idea. In this case, the two little yellow feathers were more important than all the gold in Peru.

It is almost impossible for us to realize the splendour of the Incas in their own days. On a great festival day in Cuzco the narrow streets flanked by grey stone walls must have glittered with the colours of the brilliant clothes and feathered head-dresses of people from all parts of the Inca Empire. Chiefs and their servants from as far apart as Quito in Ecuador and the River Maule in Chile would flock to be with their Lord, the Supreme Inca, at his great festivals. Indians from the cities of the Peruvian coast and befeathered savages from the Amazon jungles mixed in the throngs from the Four Quarters of the Earth (Tahuantinsuyu), as they called the Inca Empire. Among them were the nobles of Inca Peru, the members of the Inca family. These were distinguished from all the other people by their great golden ear-discs, which were like glittering sun images often so big as to touch their shoulders. There were many thousands of these members of the Inca clan. All were descended from one or other of the previous ruling Incas, through the two or three hundred junior wives which each Inca brought into his family apart from the Ccoya. These Incas could never become Topa Inca, or Emperor, but they held all the highest positions in the Inca State.

All these people figure in the pages of Huaman Poma's manuscript, though he was not able to give them colour for us. But apart from the chronicles written by Spaniards and Indians who had seen Peru under the Inca Empire, we have the records of archæology.

In the rocky soil of the highlands, very little has survived apart from the typical Inca pottery and the great stone walls of ruined buildings. In Cuzco itself many of the foundation walls of Inca palaces survive. Part of the Ccoricancha, the Golden Temple of the Sun, remains as the foundation of the church of Saint Dominic. However, the dating of stone walls is, in most cases, dependent upon finding pottery with them. We are quite sure of the styles of Inca pottery. The pots of the last period of the civilizations of the Peruvian coast are like the pottery drawn in the book of



Inca period pottery

Huaman Poma, and these in turn are like the more colourful pottery of the highland sites of the Inca period. But the stone walls of Peru have been made in many different styles.

The two most important methods of building in ancient Peru are based on an intimate knowledge of stone cutting. There are walls of which the lower courses are made up of enormous blocks of stone which have been given a smooth face. Their sides have been cut to sharp angles as close as possible to the original contours of the block. Into these angles other stones have been exactly fitted, with the angles cut very carefully and smoothed down so that they present the appearance of an exactly fitted crazy-paving path put up on end; but instead of small blocks, these stones may weigh tens of tons, and must have taken dozens of men to move them into position. The other style of building uses carefully squared blocks weighing about fifty pounds each. These were cut and squared in quarries, and then brought to the building site and built up as if they were simply big building bricks. Archæologists used to think that these two styles of building must have belonged to two very different periods, but as soon as they were able to identify the buildings from the chronicles it became clear that both styles were used by the stonemasons of late Inca times. Even in the foundations of the walls there was confirmation, for Inca period potsherds have been found under both types of wall.

In the streets of great grey stone walls Huaman Poma often walked with his father. For him there was

no puzzle about which walls were earlier or later. He noted the wonder of the great stones which were used in them: but his greatest interest was in his father's stories of the Incas and their ceremonies. For him this was a world just gone away, which still echoed its glories in the shadows of the great walls. But he knew well that this glorious Peru of the Inca Empire was the last of a long series of civilizations. He drew pictures of these traditions in his book; but the traditional story of the past of Peru was less fascinating than the archaeological facts discovered during the last fifty years.

# 2

## BEFORE THE INCAS

**H**UAMAN POMA had drawn pictures about the "four ages of Peru". His First Age was a time when men used sticks and stones to hunt wild beasts for food. They dressed in skins and lived in huts made of tree-boughs, or sheltered from the winds behind lean-to shelters made of reeds. How right he was!—though he never imagined that there had been people in Peru living in this way at least twenty thousand years before him. That we know so much now is due to the many scientists from all over the world who have been interested in ancient Peru.

This interest is not an ancient thing, but a quite modern attitude of mind. For three centuries after the Spanish conquest of Peru, nobody was very much concerned about the past. Spanish affairs took up nearly all the time of Peruvian statesmen, while the country was a colony of Spain. Their interest was to see that the silver mines of Potosí were sending regular supplies overseas. Later, when Peru became a republic, there was a great struggle to improve the welfare of the country and create new institutions. These were the days of increasing trade in metals, and the beginning of the close commercial relations between Peru and

the United States of America as well as with Britain and Germany. Railways were built, new roads constructed, and Peru became a flourishing modern country. But in those busy years the glories of the Inca past were almost forgotten, and very few people indeed were able to get down to serious archæological work.

Baron von Humboldt had travelled through the Peruvian highlands, reporting on the wonders of geography and natural history together with the remains of Inca buildings. An English sea captain had brought back some strange wood carvings found deep under fifty feet of sea bird droppings (guano) on an islet off the Peruvian coast. The German travellers Reiss and Stübel had produced an illustrated archæological report of their very careful excavations of a great pre-Inca cemetery at Ancon, and thus people came to know of the archæological treasures still to be found in Peru. But this knowledge was disconnected. Meanwhile the cemeteries continued to be pillaged by grave-diggers in search of gold. These *huaqueros*, as they were called, were equipped with long thin rods with which they probed the sands in hopes of locating a burial. If they found that anything obstructed their probe, they dug it out. Sun-dried mummies were thrown out of their graves, and their beautiful textiles were ripped away and destroyed in the search for gold ornaments on the bodies. Pots, too, were taken, because they could be sold for a few pesos to visitors who liked to take these "Inca curios" away with them to their homes. Peru was in danger of losing its

wonderful past even before any scientific workers could study it properly.

We owe the revival of Peruvian interest in the great past of the country to a number of active people who realized in time that it was possible to reconstruct a history from the buried remnants which were left to them. The inspiration probably came from reports of the wonderful work of Professor W. M. Flinders Petrie in Egypt. The greatest of the Peruvian scholars in this field was Dr. Julio C. Tello. The story goes that Tello was partly of Indian descent, and as a boy used to sell papers in the streets of Lima. The stories of the past of the Indian peoples fired his imagination, and he set out to win himself a good education. His efforts were so successful that he was able to take up a junior position in the National Museum of Peru in Lima. Finally he became the Director of that great museum, which he inspired with his own enthusiasm for the scientific study of the past. Naturally he made many discoveries, and did not always find the answer to the problems which they raised. His work was a foundation upon which many other researchers have been able to build up our present rich knowledge of Pre-Inca Peru.

Most of Tello's research concerned the civilizations of the Peruvian highlands. He showed that the influences which spread from Tiahuanaco, near Lake Titicaca in Bolivia, were by no means local affairs, and that they represented something like a highland empire long before the Inca. He placed even earlier the strange culture which was in his day known only by a ruined stone temple at Chavín de Huantar. Between these

periods and the Incas there were many different civilizations of sorts: mostly quite small in area, and probably representing tribal confederations rather than empires. It became clear that the Inca were the last of three civilizations which had arisen in the highlands of Peru, and that all three had reached very high levels of skill in working stone.

Naturally Tello was also interested in the coastal cultures of Peru, and here he was able to show relationships between the Tiahuanaco Empire and the Nasca people of the southern half of the Peruvian coast. In the same way the appearance of Inca art and design among the works of the Chimu peoples of the northern part of the Peruvian coast proved the truth of the Inca tradition of their conquest of a great coastal empire less than a century before the arrival of the Spaniards.

Work on the coastal settlements of Peru attracted many archaeologists. This desert coast was a good place for finding remains well preserved, because of its constant dryness. Among the greatest researchers was Dr. Max Uhle, who published a whole series of books describing the sequence of pottery in the middle regions of the Peruvian coast. Another German scientist who did a great deal of research, including important air photography, was Dr. H. Ubbelohde Doering of Munich. The Americans also did great work in this region; one notes the names of Alfred Kroeber, Duncan Strong and Junius Bird as men who established new sequences of culture for the Peruvian coast, and proved the existence of settlements of



village-living Indians in this region before the discovery of agriculture. Among the greatest of Peruvian researchers on the coast have been the owners of Hacienda Chiclín, Rafael Larco Herrera and his son Rafael Larco Hoyle, who have built up a great museum of well-documented pottery series from the Peruvian coastal cultures. These include by far the largest group known of the very ancient Cupisnique pottery vessels which are linked with the highland culture of Chavín.

The result of the work of all these men, and many other scientists and students, has been a new knowledge of the history and growth of ancient Peruvian civilization. It has needed many people to bring the story together, because in Peru there are very few places where one can trace a succession of civilizations such as at Troy, or Jericho and other ancient city sites in the Old World. In Peru each civilization seems to have preferred to start in a new place. So we have depended upon evidences of trade, such as the dried body of a llama foal from the highlands in a coastal Nasca grave, or the appearance of a southern pot of Nasca type in a north-coast cemetery. Fortunately for us, all peoples on the Peruvian coast were harassed by desert conditions. They would not build cities or bury their dead on the well-watered lands where food could be grown, and so their cemeteries were crowded out into regions where burial was comparatively easy in sand. Because of this, there are a few cemeteries where one finds graves of several periods with different kinds of pottery in them, and sometimes different kinds of

linings to the tombs, usually in the form of mud bricks. Through such discoveries it has been possible to discover which were earliest and which were latest among the series of civilizations on the Peruvian coast. It has been reserved to the last few years of atomic research to give us a nearly accurate time scale for these cultures. There are no King Lists like those of Ancient Egypt to help us; in fact there was no tradition of the many civilizations which succeeded each other before the Incas unified Peru under one rule.

Our time scale depends upon the radioactive isotope of carbon which has an atomic weight of 14—carbon-14 we call it. The air consists mostly of molecules of oxygen and nitrogen. At very great heights these molecules are bombarded by particles from the sun, and one result is the production of a substance which acts exactly as if it were ordinary carbon, with the exception that it has an atomic weight of 14 instead of 12 and is slightly radioactive. This carbon-14 is soon mixed with the other gases in the air, and is eventually absorbed as part of the carbon dioxide breathed in by plants. So all living plants, and also the animals which eat them, contain a little carbon-14 within themselves. When these plants and animals die they absorb no more carbon-14. This carbon-14 is radioactive, and it slowly loses its activity with the passage of time. Fortunately for us this loss of energy is very slow, and quite constant in rate. The scientist has to find out how much of the radioactivity has been lost since his archaeological specimens were buried. To do this he has to take a sample of skin or hair or bone, or else of

wood associated with the specimen he is examining. This is reduced, by roasting, to charcoal, which is nearly pure carbon. The charcoal is then reduced again to an incandescent carbon dioxide gas which can be examined through the spectroscope to find if carbon-14 is actually present. Then the radioactivity of the specimen is measured. From the amount of radioactivity remaining since the death of the specimen, its age can be estimated.

The estimates are never exact, but are given as an average which is accurate within some fifty years or so either way. We cannot say "This wood came from a tree cut down on July 5th in A.D. 900", but the scientist gives his result in the form "This tree died 1,050 years plus or minus 50 years B.P." (Before the present.) He then adds the date of his examination of the specimen, say A.D. 1960, and leaves it to us to work out the range of dates which he has allowed us. In the following few pages you will find dates which come from carbon-14 dating methods. You must be prepared to accept them as close approximations only, and not as exact dates. In the earlier periods, they may be a century wrong; in the later, about twenty years.

The result of all this recent scientific work, where the archaeologists and physicists have joined hands, is a good outline of ancient Peruvian history. It is no more than an outline, but we know that the future will bring more and more discoveries to fill in the details. As it stands, the story begins about twenty thousand years ago.

When men were hunting mammoth in Europe, other

men were hunting mastodon in Ecuador, a little north of Peru. To the south, in Chile, hunters and fishers left the remains of their food, and several different layers of nicely chipped stone tools. They had been in that part of the world already for a long time.

The climate of South America seems to have altered somewhat during the ages. The desert belts were probably smaller, and the tropical rain forests of the northern part of the continent seem to have been more easily penetrated by wandering tribes of humans. But we find very little archæological material from Peru until about eight thousand years ago. Already at that period we have some evidence that far to the north in New Mexico somebody had begun to cultivate maize, but in Peru there was no trace of agriculture so early. The story of a little settlement on the Peruvian coast at this time seems to have been very like the story of Jericho at the same period before agriculture had begun. The Peruvian Indians lived by fishing in the warm waters of the Pacific. They built themselves a settled village, with rectangular houses made of mud bricks. In their graves, under the houses, were found very well-made fish-hooks and nets, together with matting, but there is no trace of any grains or of any pottery for storage or cooking. Only one such village is so far known to us. There are probably others, perhaps even the remains of towns to be discovered. But even as it is, we know that in South America man was settling down in well-built villages before he had developed agriculture, and also before he had discovered how to make pottery.

Before we knew anything about the state of civilization in the high plateau of the Andes, we knew there must have been people up there cultivating quinoa and, later, maize, and that llamas were known. This



A fisherman on his canoe of totora reeds

comes from chance finds from the graves of fisher people on the Peruvian coasts. These fisher people had developed weaving, and grew beans and pumpkins, gourds and canes of many kinds. They discovered the possibilities of the balsa tree for making rafts to take them on fishing expeditions, while for inshore fishing they made themselves cosy little bath-size canoes from bundles of totora reeds. After each fishing trip the little reed canoes had to be hung up to dry before being used again; but as they could easily be carried by a fisherman under one arm, there was good reason for making them.

What was going on in the highlands we do not

know. Huaman Poma pictures a Second Period in which people discovered the digging-stick and maize under the inspiration of the god Viracocha. One imagines that the highland people lived in villages, grew maize and herded their flocks of llamas, helping out their living by a little hunting and the cultivation of potatoes. Potatoes were very important in Peru, but were unknown in the rest of the world until after the Spanish Conquest.

One does not imagine that there was much contact between the coastal and highland tribes of Peru. The people of the hot dry coastland at sea level could not stand the thin cold air of the great mountains. On the other hand, the mountain peoples would soon die in the heavy, heated air of the coastal belt. Probably they traded very little, and then only in some selected places where the river valleys opened from the mountains into the coastal plain.

It is too much to expect of human nature that these tribes should have lived in peace. There must have been many inter-tribal fights over fishing rights and water supplies in the coastal regions, and about grazing grounds and fertile land for maize-growing in the highlands. Then all of a sudden, about 900 B.C., civilization came to them. Whether they developed it themselves, or whether some conquerors came in from the north, we do not know. It is strange that it happened about the same time as the first development of a true civilization in far-off Mexico. Several serious archaeologists feel that there was some connection between the two events, but it may take a generation of research

before we can prove anything. The common factor in these two areas is the use of stone for monumental sculpture, and its dedication to the gods of the earth. In Peru this took the form of terrifying sculptures of puma gods and the gaping jaws of gigantic serpents.

We now know that this first civilization of highland Peru was centred at Chavín, but that in the valley running north towards the Amazon forests there were three or perhaps four other cities with stone temples and images of the puma and serpent gods. The Chavín culture also had the closest artistic contacts with the northern coast of Peru, where, at Cupisnique, great numbers of tombs have been found containing grey pottery decorated with designs identical with those on the stone sculptures of the Chavín culture up in the mountains.

Simple weaving was used without the elaborate embroideries and tapestries of later times. Houses were built of big oblong mud bricks. There is not a trace of writing, or even of the knotted string quipus used for keeping records in later ages. But these people were very fine workers in gold, making jewellery with their characteristic serpent and puma designs on them. Now, did the Chavín culture come up from the coast to the mountains? Or did it arise in a mountain valley on the eastern side of the Andes and later spread westwards? We do not know. There is a fascinating field for future discovery here.

After the sudden appearance of high civilization in the north, the next developments were in the south of Peru on the coastal belt. At Paraccas, a cemetery was

discovered in which the dried bodies of ancient Peruvians were seated in their graves, wrapped in a fantastic profusion of wonderfully embroidered cloths. The dates are from two centuries B.C. until a little after the beginning of the Christian era. Associated with the Paraccas culture are fine gold work, wooden boxes and rather simple pottery, with scratched outlines of figures, often coloured.

The cloths were made of fine cotton grown locally, embroidered with cotton and also llama wool threads which must have come from the highlands in trade. The embroidery covers the whole of immense cloths as if they were richly patterned carpets. It must have taken the women an immense time to prepare the cloth for a single burial. In fact it appears that here we have a civilization where there were nobles who could afford to employ people to work for them.

The cloths also tell us of serpent gods, warriors who carried the heads of their enemies, deities of the pepper plant, and a kind of magic fertility serpent with a cat's face. Not far away from Paraccas we find the same designs painted in colour on beautifully made pottery from a number of sites around Nasca. The Nasca culture used gold, and the warriors carried long throwing-sticks with a stone axe blade set half-way along. This was in the early centuries A.D., though this strange weapon was used in recent times by tribes such as the head-hunting Jivaro on the edge of the Amazon rain forest. Another problem lies here . . . has the Nasca culture any relationship with the other side of the Andes? We shall find out one day. In any case, the



Nasca people painted their pots with gods and demons. In later times they included a god with a white beard. We meet this god again much more certainly in pots from the northern coast.

Meanwhile, just before the Christian era, Tiahuanaco was built on a high plateau more than two miles above sea level, beside Lake Titicaca in Bolivia. It is obvious from the ruins that Tiahuanaco was once the metropolis of a great civilization. Great carved slabs of stone litter the site, including standing figures, and there is the gateway of the sun, in which we recognize a strangely Inca god with short tunic and thick belt. His eyes weep tears, and we remember the relationship between the sun god and the rains as he moves his path across the heavens from south to north. Also there was the Inca legend that the tears of the sun were the origin of gold. This god at Tiahuanaco, is crowned with a fan of condor heads like rays of light. In his hands he holds condor-headed serpents, no doubt the lightning serpents. Around the god is a squad of smart little winged figures with condor heads. Each one kneels, but the wings are extended. The gate is often said to have been a calendar; perhaps the winged figures are representations of the stars moving across the heavens beyond the sun.

Suddenly, about the fourth century A.D., we find the artistic style of the Tiahuanaco sculptures on the coast. This irruption marks the end of the Nasca culture, and it leaves effects on several smaller cultures north of the Nasca region. Have we an empire here? Montesinos records an Inca story of a race of Amautas who were

rulers in Peru for eighty generations before the Incas. The period seems impossibly long—about two thousand five hundred years—but maybe the legend refers to the Tiahuanaco Empire. For a while Tiahuanaco was supreme in the southern half of Peru, but by A.D. 400 or thereabouts the empire seems to have collapsed. We have no written traditions to give us an historical picture. All we know is that the city remained a very sacred place even in ruin, right through Inca times. Its art disappeared, and the southern cultures of the Peruvian coast never recovered. Nasca and Paraccas became just graveyards, and the coastal peoples continued life in small towns. They continued to make rather undistinguished pottery and weaving until the Incas absorbed them into the empire.

Meanwhile near the centre of the coast of Peru, not far from the present site of Lima, arose a great sacred centre for the worship of the creator god, under his name Pachacamac. An ancient pyramid temple became the place where the spirit of the Creator entered into priests and gave oracles, and from all parts of Peru people came in pilgrimage. Later the Incas realized that Pachacamac was the same as Viracocha, and they also made rich offerings at the shrine. Strangely enough this great temple was never the centre of a political state. Many lesser city-states arose in the neighbourhood, all of them with some echo of Tiahuanaco art in their background, but none of them seem to have been absorbed by their neighbours until the great days when the Incas unified all Peru.

On the northern half of the Peruvian coast there had

been a long succession of cultures known by the remains of mud-brick buildings and the vast amount of pottery which they produced. Their characteristic vases with loop spouts appear as early as Cupisnique times, when the spouts were so large that they seem to have been coiled round the fingers of the potters. Later, as one civilization succeeded another, the arts and crafts became more refined, until we find pots of almost egg-shell thinness made in moulds.

After the fall of Tiahuanaco the peoples of the northern half of the Peruvian coast proceeded in their almost uninterrupted development. It seems as if they had been aware of Tiahuanaco civilization, but never greatly influenced by it. In the period between the fourth and fifth centuries they produced the Mochica culture, which we have named after the Muchik language spoken in those parts. We know a great deal about them, from the paintings on their pottery. They used coloured beans for counting, built pyramidal temples of mud brick with temples on top, and held annual races to see who could first reach the top of the pyramid and bring luck to the crops, including the beans.

It is quite obvious that these Mochica were a rich and cultured people, who used metal so well that they could make excellent bronzes hard enough to use as knives and chisels. They were workers in gold, and developed the rich silver resources of Peru for the first time. Their pots include magnificent individual portrait heads in clay which reveal them clearly to us as a typical American Indian group, many of them not unlike the present-day Araucanians in appearance. But

among these pots occur a few puzzling ones representing a man with a long white beard; in some cases he holds a bird in his arms almost like a domestic fowl. There is a mystery here for you to solve in the future. Was this personage a god of some star, bearded like a comet? Or was he perhaps a representative of some Polynesian voyager-chief come by canoe across the wide Pacific, bringing a fowl with him? Or could he have come up the Amazon from an Arab trading ship which had crossed the Atlantic from the Western African coast? Though it seems crazy, any of these solutions might be possible. (That is one of the fascinations of archæology; even half a dozen curious pots may stir up ideas involving half the world.) As the Mochica culture developed, the use of silver greatly increased. In fact, it is possible that in the next period black pottery became extremely fashionable just because of its resemblance, when filled with water, to tarnished silver.

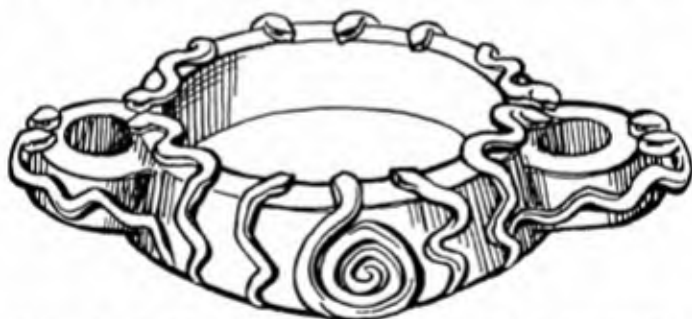
From about A.D. 1000 to the time of the Incas, the northern Peruvian coastal peoples were united under the rule of a chief known as the Chimu. They were rich beyond all their immediate needs. The cities were large and filled with great square courtyards which were lined with rooms around a central garden. The rivers were diverted through narrow canals to make every possible square yard of soil yield its best crops. The Chimu had a special court of nobles and officers around him, and was decorated with magnificent jewellery of gold and silver. In this hot coast land silver was regarded as especially precious because it symbolized the moon god, Si, who brought the coolness

of night to the parched country. The Chimu were great traders and travellers, and it seems, from the researches of Dr. Thor Heyerdahl, that they were familiar with the Galapagos Islands five hundred miles off the coast of Ecuador; certainly their pottery has been found there. They were the richest of all among the civilizations of Peru until the Incas came upon them, and after that they still remained rich enough, sending the gold to Cuzco and marrying an Inca princess to the Chimu himself. They were reputed to be a lazy people, but it seems that they were so well off that they saw no sense at all in fighting a superior Inca army over a question of polite words towards the Inca and the payment of a tribute which they could well afford. War would have brought the burning of towns and the breaking down of the irrigation ditches, and they thought that this would be just stupid. So just after the middle of the fifteenth century A.D. they rather grudgingly accepted the rule of the Incas over their ancient kingdom.

Up in the highlands of Peru the archæological record is far less complete. There are many remains of stone buildings and sculpture, but few graves with trade goods, and no stratified sites so far recorded. After the collapse of Tiahuanaco, the great city continued to be a holy place of pilgrimage. The Incas later built a sun temple there, and our finest Inca period cloth comes from a stone box found in this temple by the French traveller Bandelier.

The Tiahuanaco-style designs continued, in a much weakened form, through what is called the "Pucara"

(Fortress) culture to the verge of Inca times. At some point the great stone sculptures of Aija Huaraz were made. The Colla people, perhaps the descendants of the builders of Tiahuanaco, erected stone towers with little rooms reached by staircases in which they stowed away the dried bodies of their dead. But the puzzle is so complex that one is made very sharply aware of the multiplicity of tribes in this region, who were later named as becoming subjects of the Incas. One group of them, the Yauyos, in the mountains behind Lima, were great medicine-men and healers. They were the specialists of ancient Peru in the treatment of injuries of the skull. They not only left behind many skulls which had



A stone bowl of the Inca period with serpents symbolizing the earth

been trepanned by removing a section of bone, but a very good number of recovered patients who showed in their skulls a healthy growth of new bone to replace the damaged section. This art was always very valuable in a country where the principal weapon was a bronze-headed mace.

It was about the middle of the eleventh century, at nearly the time when the Normans conquered England, that the Incas say that they first appeared on the scene. According to their legends, they had come from the East. With them they carried a wedge of gold, and everywhere they stopped they laid the wedge on the ground. At last the wedge sank from sight in the spot where a beautiful valley marked their future home for them, Cuzco, the Navel of the Earth.

The first two Incas controlled only Hanan Cuzco (Upper Cuzco). One gains the impression that they were considered as great aristocrats, but the heads of an important tribal lineage of chiefs ruling part of the city, rather than the divine rulers of a nation.

It was the danger of raids by neighbouring tribes which led the people of Cuzco to choose the Inca to rule the whole city, and the need to protect it still further that led the fourth Inca to set out to conquer the whole of the valley in which the city was situated. It was at this point that the Chanca confederacy of tribes decided to destroy the new power, and failed miserably. The next threat came from the Collas, who ruled the mountain plateaux north from Tiahuanaco. This produced a bitter war, but in the end the Incas emerged victorious, and found themselves the undisputed rulers of all the tribes of the highland plateau of Peru. From that moment their path was clear. Their father the sun had made them emperors as well as a sacred family. Their duty was to extend the faith in the sun and the blessings of Inca-organized government to the Four Quarters of the Earth. Tahuantinsuyu was the name of

their realm, the Four Quarters, and at the time of the arrival of the Spaniards it was two thousand miles long and five hundred miles in width in the deepest section just north of Cuzco. Such an empire was unknown before in Peru. For the first time the many peoples of whom you have read a little in this chapter, were united. In this union their history was lost, until the patient piecing together of puzzles buried in the earth restored some outline of their former glories.



# 3

## CENTRE OF GOLD

WHEN THE sun rose in the morning, the door of Ccoricancha was wide open and the bright rays passing through the dark building struck the very centre of gold, filling the building with the blinding reflection of its rays and making it indeed, as its name means, "House of Gold". But of the image and the temple to the god and father of the Incas we will speak later.

First we go up the hills to where the Hawk's Nest, Sacsahuaman, fortress guarded the road into the city. There in the centre of the walls we climb up the low circular tower which was there in olden times. (It was only remembered a few years ago, when its foundations were rediscovered.) How fantastic this view, the grey ranges of mountains rising to snow-covered ridges in the distance, and below us the bowl-like valley through which a tumbling little river runs among the rocks. On the slope above the river is Cuzco, the Inca capital.

If we were with the circling condors gliding lazily in the rising air-currents, we should look down on a city of thatched roofs, clustering here and there around a courtyard, and lining narrow streets which make their way straight up towards the open space in front of

Ccoricancha. On one side in the valley is Ccolcampata, the level field where the Inca might review his troops, and the brave young men compete for prizes of honour in the yearly examinations for warriors of the Inca blood. To our mind Cuzco would seem a small and crowded place, where only ten or twenty thousand people could be crowded together; but to the people of Inca times this was the holy centre of an empire of which the ruler was descended from the sun. The grey stone walls of its streets were topped by rounded roofs of thatch, which was four feet thick, and kept the buildings beneath cool by day and warm at night.

It was not a walled city, but every house could easily become a fortress because of the strength of its masonry. The atmosphere must have been very forbidding to the stranger. The narrow streets were wide enough for two loaded llamas to pass, and were steep and unrelieved by decoration or colour. Each building faced inwards to its courtyard, and to the street it presented a wall of stone, impenetrable and secretive. Perhaps the coloured doorways permitted an occasional glimpse of the brilliance within, but this was not for the stranger. On days of festival the city was crowded, but the buildings accommodated only those people who had a right to enter them. The mass of visitors camped out, like a multi-coloured army, in tents and bivouacs along the valley. The army itself camped on the exercise field, and, of course, many of the soldiers were stationed up in the Hawk's Nest fortress.

Many of the buildings in Cuzco were in effect Government offices. Here dwelt the representatives of

the various regions of the empire. Princes from each captured people were kept in Cuzco as hostages, but they were given every freedom. They had a good allowance of food and fine clothing, were taught the official Quechua language and shown exactly how the Inca system of government worked. The Incas well knew that their methods were the best in all the world for bringing prosperity and happiness to the people, so they had no fear of teaching their system to hostages. It only made the captives closer friends of the Inca system.

Such a little palace for a hostage prince was arranged around the central courtyard, where there were patches of carefully tended flowers and plants. The kind mother symbol, the maize, grew there, and the many charming alpine flowers of Peru, including petunias. At one side of the courtyard was the hall, together with some smaller sleeping rooms for the prince, his wives and attendants. A bed was a simple pile of soft rugs and coverlets. Clothes were not hung up, but put away carefully in big carved wooden chests, which were painted and decorated with mastic inlay. The hall was fitted with a raised throne on which the prince would squat with his feet above the ground. There were other seats, less elevated, for the other people of the household. Tables were very low, because one ate from them while sitting on cushions on the floor. There were cups and beakers, together with platters and dishes, made of beaten silver or lacquered wood. The floor was covered with fine reeds, and, above, the thatch reflected the light straw colour. Windows were small, if any, and

most light came in through the wide doorways. On the grim stone walls were hung brilliant tapestries, with the many colours arranged in the pattern in a regularly changing order—the Peruvians loved this kind of play with pattern and colours arranged in a mathematical way. In niches on the wall were boxes of personal belongings, and also ornaments of silver and bronze, with decorations in coloured feathers.

At the wings of the courtyard there were ranges of small single-storey buildings, where the women could spend their time weaving, and workmen carved wood and worked in metal. Some of the offices were occupied by the Quipucamayoc, who was responsible for keeping countless files of knotted cord quipus. These were made up in colours, which denoted the nature of the records, and filed in chests where they could easily be taken out to be read. The records of such an office were all about the production of food and clothing, and the numbers of people in the home provinces. Every now and then a summary was made; this was sent to the Keepers of Records of the Inca, and a duplicate copy kept in the files at home. That was one of the secrets of Inca success; all records were kept in a truly businesslike way, so that if information were wanted it could quickly be found. The keeping of his records was a good training for a tribal prince, for one day he would become a tribal chief and go home, where he would be responsible for keeping up a steady supply of records for the central government offices in Cuzco.

At the end of the courtyard nearest the entrance

there would be a few round stone buildings with the usual thatch domes. The doors were very small, and kept carefully barred, for these were the storehouses in which sacks of food were kept—maize, quinoa and potatoes for the consumption of the household. Each day some fresh meat or fish was brought in from the markets, but grain and potatoes were the staple food-stuffs. There were also other storehouses in which the official allowance of clothing for the men and women of the household were kept.

There were other courtyards in which the houses were the homes and offices of the various state recording officials. There was no dashing away from the office at night for these men. They worked for the Inca, and were kept by the Inca in their palaces where they lived and worked. After all, their life was continued only as long as the Inca wished; so while they were able to serve him, it was right that they should live and be clothed from his share of the national wealth. They simply did not have a separate life of their own; they were completely at the service of the Inca Government. It appears that they were quite content with this. They would have had no more personal freedom if they had been simple farmers, and now working and living in Cuzco was to them quite a wonderful reward for serving the Inca well.

All the higher officials were members of the Inca family, and lived in Cuzco as in their home town. Everywhere they could be met with, flaunting their fine clothes and golden ear-discs. People bowed to them with great respect. These were the distant relatives of

the Sun. Yet they were not useless drones in the hive of the Inca Empire. They were leaders in war, judges in law, organizers in all branches of the national life. People said that these lesser members of the Inca family were above the law, but that was not quite true. They were not taken before the courts or publicly punished. If one of them were foolish enough to dishonour the good name of the Inca family, he would most likely be found a place in the dangerous outposts of the empire, or even to disappear from public life; although later on his carefully dried body would have its place in the family mausoleum.

There were a number of palaces in Cuzco which were owned by no living person. These were the palaces of



The mummy of a dead Topa Inca carried to his palace

the dead Topa Incas. Each palace had its full set of servants and officials, its supplies of gold, fine cloth, and delicate foods. One day they knew that the dead Incas would be alive again. They were awaited with all honour, and a good deal of affection. Their bodies remained in Ccoricancha, but once a year they were brought to their palaces and treated with all the ceremonial to which they submitted in life.

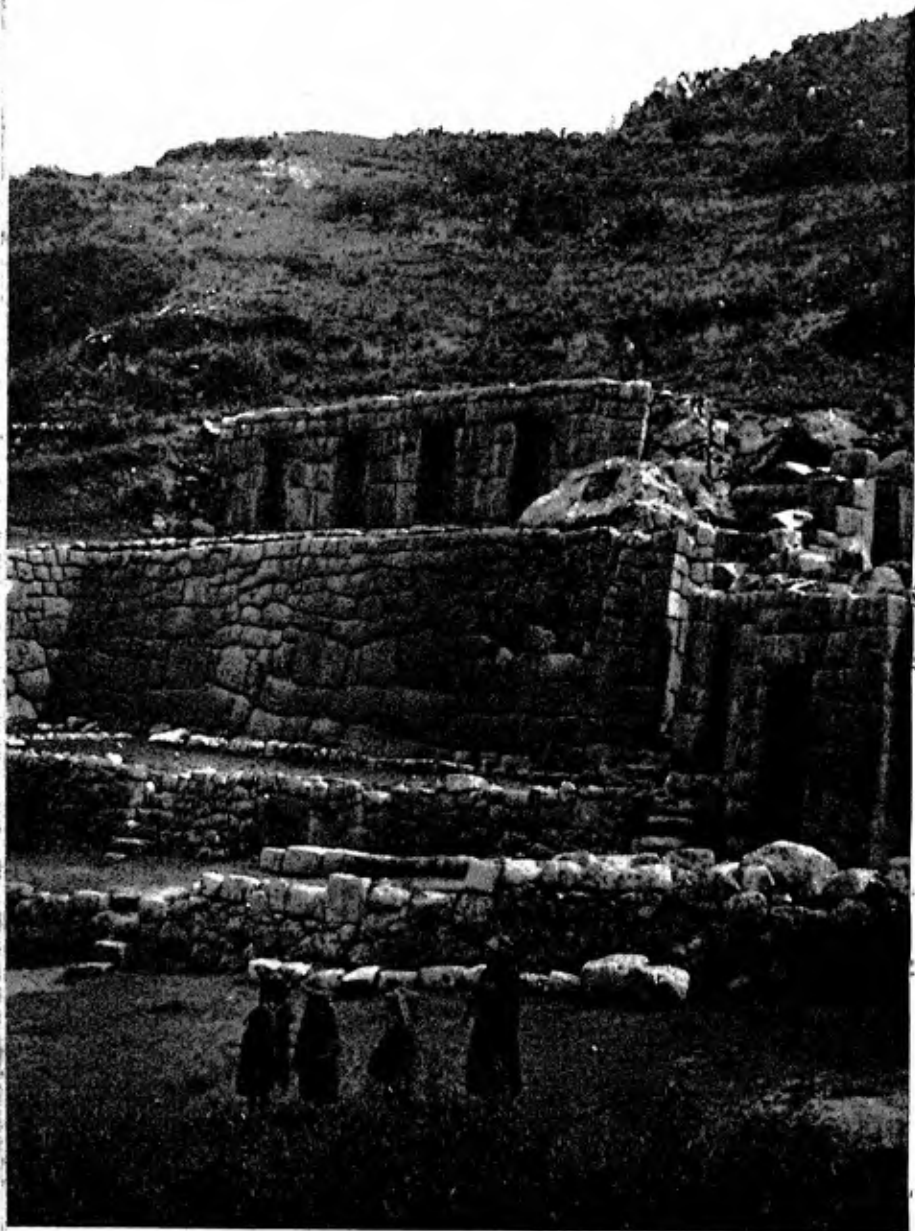
The Inca was the least free of all Peruvians. His title was Topa Inca, which meant Only Inca. He was expected to live up to the position of the direct descendant of the Sun. His every action was noted, and he had little peace or quiet in which he could do just as he wished. His wonderful palace, with the thousands of servants and hundreds of princesses who were his wives, was something like a temple in which he was a golden image. Would he go walking in the garden of flowers, his feet were not allowed to touch the earth, for servants spread wonderful cloths. The very plants and flowers of the palace garden were transmuted by some dreadful Midas touch into flowers of gold and silver. Did he wish to drink the sweet maize beer for refreshment, it was poured first into a silver vessel for a servant to taste lest it be poisoned, and then it was put into a beaker of gold for him to drink. In fact, he might even have to recline as gracefully as he could while a servant poured the sacred drink through a golden tube into the sacred lips of his divine majesty.

The Inca could not even choose his own wife. The Ccoya must be his own sister, because the Children of the Sun must be of pure Sun descent on both sides of

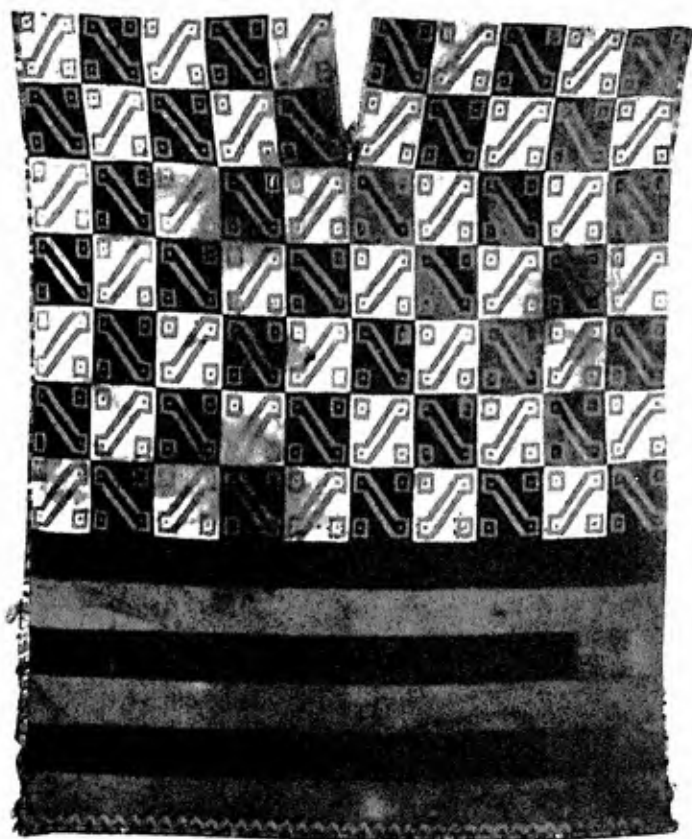


Quechua-speaking Indian children at Tampu Machay. In the background are the springs which once ran through silver pipes to the golden bath of Inca Tupac Yupanqui. (Photograph: Ferdinand Anton, Munich.)





The ruins of the pleasure palace of Tampu Machay. Note how the Inca masons fitted a great natural boulder into their masonry. (*Photograph: Ferdinand Anton, Munich.*)



Woven shirt for a nobleman with typical Inca design. Colour changes are introduced to break the monotony of the design. (*Photograph by courtesy of the Museum voor Land- en Volkenkunde, Rotterdam.*)



Wooden standing cup, inlaid with a mastic picture of Inca nobles wearing elaborate feather head-dresses. (*Photograph: Ferdinand Anton, Munich.*)

the family. His other wives were usually chosen for him; they were either the daughters of chiefs who were brought to be royal wives for political reasons, or else the rather too-well-educated young ladies who had been taught in the strict convent of the Daughters of the Sun. Perhaps the Inca kept some of his dreams for himself, but there was always a soothsayer near at hand to interpret the meaning of the royal dreams for the benefit of the nation.

Once a year he was free. He entered the temple of the Sun on the morning of the festival of Ccapac Raymi, took off his turban and Llautu, kicked off his golden sandals, and for a while was just a man alone before the image of the Sun and the creator. Ccoricancha must have been a house of peace for the Divine Inca.

The palace of the Inca was a larger version of the usual stone courtyard house. Its roof was thatched with four feet of golden-yellow grass. The outer wall was made of carefully selected stones laid with great care, so that one of the Spanish conquerors, trying to find out what cement was used to hold the walls together, found that the stones had been ground down so exactly to fit that he could not get the blade of his steel knife between them. There were no arches in the building, or any other in all Peru. Windows were few and high up. They were shaped like the doors, where the sides sloped slightly inwards towards the top, and the top itself was a single huge stone lintel.

Within the building, niches in the walls were filled

with flowers of gold and silver. The furniture and tapestries were like those in lesser houses, but of far greater magnificence, glittering with golden ornaments and featherwork of every colour. There were many courtyards in the palace buildings, so that business could be dealt with separately from the state apartments. The largest of the courtyards was filled with stone storehouses which housed great quantities of grain, wool, cotton, dried meat, sets of clothing, sets of armour and stores of weapons. All this was taken from the Inca's personal tax of one-third of all goods produced in the country. Yet little of this wealth went to the Inca's personal use. He paid his officials from these stores, and kept a reserve of material which was freely distributed in any area where crops had failed, or attacks by enemies had destroyed the goods of the population. In fact, the storehouses of the Inca were a form of social insurance for the whole of the nations who lived in Tahuantinsuyu.

Similar palaces housed the priesthood, for there were many priests and priestesses who served under the Villac Umu, who was usually a brother of the Topa Inca. Only this High Priest was on permanent duty; the others all served in the temples for a period and then spent some time away from their duties. It is interesting that these people wore no special dress; it seems as if they felt that it was the most natural thing in the world to be near their gods and work in the temples. Unfortunately, we have no knowledge of the mysteries of the services or the sun temple, which was entered only by the Inca and the Villac Umu.

One of the important buildings, of which the walls still stand in the narrow streets of old Cuzco, was the House of the Virgins of the Sun. This was a nunnery specializing in all the duties of looking after the temples, and weaving the most wonderful cloth for the temples and for the Inca. The Inca alone must have kept several girls working constantly, because he was never allowed to wear the same dress twice. As soon as he changed his clothes, the old ones, only used once, were whisked away to a special store, where they were kept for use as particularly important gifts to visiting chiefs and favourite noblemen. The same might happen to the girls in the convent, since they also were valued as presents to be given as wives to great chiefs. These young ladies were selected when about eight years old from any family in any part of the empire. If a girl was noticed to be exceptionally clever and intelligent as well as good-looking, the local chief was expected to give a report to his town governor, who would in turn send a report to the Inca governor of the province, and he in turn would pass on his selection from the best of all such reports to Cuzco. The princess in charge of the Sun Maidens would consult with the Inca, and then messengers were sent out to bring the selected girl to Cuzco for training.

The great grey Convent of the Sun Maidens was at first a place for hard discipline and learning, but gradually the girls became skilled in their delicate weaving and embroidery, learned the songs in honour of the gods, and were taught how to run a household well.

No man was ever admitted into this convent except the Inca himself. When the girls went to the temple, they wore special clothes and were marked out as people who were dedicated to the Sun and not to be looked at, much less spoken to, by ordinary people. They were a group set apart, much more so than the priests. Some were given away by the Inca to be married, but many stayed in the convent all their lives, the white sisters dedicated to the service of the Sun.

Beyond their convent through the steep narrow streets one approached the great square before the House of the Sun. The holy place of the Incas was a cluster of buildings. There were houses for the moon and stars, a palace for the rainbow and thunder, smaller temples for all the gods of the subject tribes within the Inca Empire. The stone buildings were quite plain, with the usual heavy thatched roof. But at the end was Ccoricancha, marked by the rounded apse at the west end, and a two-foot-broad cornice of gold right round the top of the walls outside the building.

There are very few accounts of Ccoricancha. Its massive walls support the Church of St. Dominic, but few of the Spanish conquerors saw the interior of this mysterious temple before it was stripped of its colossal treasure to pay a ransom, before the false Inca Atahualpa was murdered at the hands of equally false Spaniards. However, we do know that the walls were lined with deep niches in each of which squatted the dried mummy of a dead Topa Inca, wrapped in his finest clothes and seated on a golden throne. The Spaniards who saw these mummies tell of their won-

derful preservation. At the end of the temple, above the rounded apse of the main wall, was a great relief covering the whole end of the building in gold and emeralds. In the centre was the image of the Sun represented with rays around his face. On one side were Morning Star, and a constellation of small stars above a rainbow, together with the symbols of the Pilcomayo River and the Valley of Cuzco. On the left were the moon, the Evening Star, the clouds of the sky, and a fox beside a tree. Right above the centre were the stars of Grus. An empty space represented the creator Viracocha. Below were the stars of Pegasus, and figures of the first man and woman standing beside the place where they were created. These symbols showed the East and the West, and the Central Line of Creation. This was on the meridian of the midnight in August, when the stars passed across the heaven announcing the day when Fomalhaut would be nearly overhead in Cuzco. This day was the beginning of the rainy season, and was the occasion of the Situa festival.

The Situa was a very important matter. It began by driving sickness away, and ended by uniting all the people of the empire. At the first new moon in August the Inca and High Priest met with all the nobles and priests of Cuzco in front of Ccoricancha. Then and there they decided which of the series of ceremonies should be included and which left out for the coming year.

The announcement of the festival was made on the following morning and the first preparations began. All



dogs were driven out of the town. Everywhere people were running around the houses routing out the unfortunate dogs and driving them away, though maybe pets were taken to stay with friends outside the city. Then all cripples and sick people were given presents and helped to camps outside the city. These included all members of the Inca family who had been punished by the gods by the breaking of an ear-lobe so that they could not wear their golden ear-discs. Then anyone who was known to have been unlucky during the year went outside the boundaries. Only the people of Cuzco remained in two sections, the Higher Cuzco and the Lower Cuzco. Outside the city still other camps were filling up with strangely dressed foreign tribesmen who had brought their gods to join in the festivities.

The feast opened officially on the next day. On two sides of the square in front of Ccoricancha were rows of benches for the people of Hanan Cuzco and Hurin Cuzco, all wearing their war dresses of quilted chequered tunics and copper helmets fringed from ear to ear with feathers. First there was a kind of review by the Inca, and prayers by the Villac Umu; then the warriors faced up in four squadrons towards the four directions. At a signal they raced along the roads going outwards in the four directions lifting their shields and shouting at an invisible enemy "Away! Away! All evils away! All sickness away!" At the end of the run they reached rivers into which they plunged, so that all bad luck should be washed off them and dispersed in the distant seas. Thus protection of the people from the wet-season illnesses was hoped for.



The Topa Inca leads the young warriors at the Situa festival

The second day of the festival was devoted to the gods of the Inca. Again the people of Cuzco seated themselves (but both men and women were here this time, in their finest clothes). On the far side of the square was a golden bench on which were seated the dead Topa Incas together with their Ccoyas. They seemed alive in their beautiful robes, but their eyes were cast down as though they meditated on the things of another world. Opposite them sat their descendant, the living Topa Inca, on a golden throne before the gods. The images of the Sun, Rainbow and Thunder were there, and Huanacauri, a relative of the Inca, a giant turned to stone, was with them. Prayers were said to the Creator, and then to the other gods, asking for blessings and protection. Next a great bowl of coarse maize porridge was brought in, and everyone came to take a handful of this "Pudding of Divine Protection". From the Inca downwards each one smeared a little on his forehead and then ran to his home with a handful which was smeared on the doorpost of the house to protect it from all danger. For the rest of the day the hand, white with porridge, was left unwashed. It was a hand of blessing.

The third day was also in honour of the gods. The Cuzco people danced in long red robes, circling to the sad tones of the panpipes and flutes which they loved more than any other music. Then the great square was suddenly invaded by flocks of pure white llamas. There were many thousands of them. From them all the High Priest selected four, and they were immediately killed and the bodies burnt before the gods. Maize beer was

then poured from an enormous gold-plated vase by the Inca. This was very special chicha brewed from the whitest maize grown in the fields of Cuzco. The rest of the llamas were killed, skinned and roasted, and the whole population ate of this meat; it was a gift from the gods, because the white llamas were taken from the flocks belonging to the temples. At this stage the sick people and the unlucky ones were brought back to town and given their share of the meat and maize beer. It was a sign that the wealth of the community was to be given for the good of all, even the naturally unlucky ones.

The fifth day was one of colourful processions and dancing. From their camps outside the city, the nations of Tahuantinsuyu marched in from the four directions. All were in tribal dress, and were led by their chiefs riding in befeathered litters, carried on the shoulders of their followers. Each tribe brought an image of its own god to the great square. There, with wild singing and dancing, the gods were presented to the gods of the Inca. The High Priest made the speeches of welcome, and then the images were taken away, each to its own little temple beside Ccoricancha. The chiefs returned to the square with the old images which had been brought in at the previous year's Situa festival. The Inca then commanded them to be loaded with presents to take home with them.

It was a golden occasion of colour and organized happiness. Cuzco was filled with colour among its grey walls, and the singing and dancing went on all the night. What was not wanted had been driven away;

what was desired had been welcomed. Tahuantinsuyu had been strengthened, and the great gods had been honoured. Then the dogs were allowed to wander back into the town. They probably wondered why so many of their masters were suffering from a hang-over . . . but dogs never drink maize beer.

# 4

## TERRACES AND TOWNS

OUTSIDE CUZCO there were many beautiful towns and palaces. In the Valley of Yucay, the great Inca Tupac Yupanqui built himself a pleasure palace, of which a good deal of the stone-work remains today. Among the curious things there, one can see the Inca's bath. It is a circular basin of stone into which a mountain spring pours a stream of fresh cold water. These Incas were delighted to take invigorating cold baths while they were enjoying their palace in the valleys, which were at least green and humid compared with the highland harshness of the Cuzco region. In those days the spring of water gushed through a silver tube, and the bath was lined with gold.

All this luxury of the Incas was paid for by the work of the people. They filled the Inca's granaries with a third of their produce and they filled the storehouses of the Sun with another third of their produce. The last third was for their own use. However, they gained very solid benefits in return for their high taxes; they were assured of peace and trade, of regular supplies of necessities in time of famine, and of a special kind of return in entertainment and festivity at the great religious ceremonies. However, each family had to produce

three times the amount of food which would be needed for themselves. If they failed in this through their own fault, they went short. The supplies for the Sun and the Inca came before individual needs.

The consequence of all this organization was that every possible piece of land had to be cultivated. Towns and villages were built on bare rocky spurs of the mountains, so that no land should be wasted. The valleys were carefully irrigated so that all fields should have their share of the waters from the mountain sides. Then, when all the valleys were cultivated, the people took their fields ever higher and higher on the mountain sides until they reached the cold zones, where maize and quinoa could not be grown; even then, they managed to raise some potatoes. The grass of the high *puñas*, plateaux near the snow-line, provided the pasturage of immense herds of llamas, where even the native herdsmen moved slowly because breathing was difficult. No land was wasted in ancient Peru.

The little fields up the hillsides were called *andenés*; probably the name of the Andes came from them, just as in Europe the Alps are named from the *Alpen* mountain pastures. The *andenés* on the mountain sides looked very like the vineyards of the Rhineland. At the foot of the slope a long wall of stones was built by the villagers. It was about two or three feet high. The earth behind it was scraped down until it made a level shelf, reaching back from the wall. Then stones were collected and another wall built. Earth was again scraped down to make another level shelf. As soon as that was completed, another wall and shelf were com-

pleted; and so on right up the mountain side, except where sheer precipices of bare rock barred the way. Even the mountain streams were tamed. As they burst out of the rocks, or leapt over precipices, they were caught in basins of stones and led into channels which ran along the stone walls. Running the length of one row of little fields, they turned and were led through a stone gully into another channel running along the lower level. So, before the stream reached the valley, it had spread its water wherever it was needed along the mountain fields.

Because of the need to build villages only on stony ground where crops were difficult to grow, it was usual for the village to stand above the fields which belonged to it. After the morning meal of maize porridge and herbs, the villagers would climb down the steep stairways of stones which led to their fields. There they would be busy caring for individual plants. They removed all weeds; absolutely nothing was left which might harm the development of the beloved maize. To the Incas, there was something sacred about the plant; it was more than just an ordinary food crop. They also grew quinoa, which is rather like millet with its great clusters of small seeds. On the walls of the fields they grew beans, and in the lower valleys, where it was warmer, they produced many kinds of pumpkins and gourds. The potato was grown higher up the mountain sides, but with the same exact care with which maize was treated. They even made an occasional sacrifice of a human being to the potato spirits, but such killings were very rare in Peru. However, the strange way in





Digging and storing the potato crop

which the potato could be cut up and a new plant grown from each "eye" was obviously a great magic to them.

There were many varieties of potatoes, grown in different soil and at different levels. One of the best was the small chuñu, which was grown very high up. When harvested it was taken to dry in frost near the snow line. After freezing, the little white potatoes were crushed into a powder which could always be boiled up in water to make a nourishing soup. One gains the impression that the mountain villagers were not only desperately anxious to cultivate every inch of ground in their andenes, but that they had a very good scientific knowledge of the crops which they grew.

The usual village consisted of a row of stone-walled huts with thatched roofs and beaten clay floors. The stone-work was rough, just piled natural stones held together with clay. The door posts and lintels were usually made of more carefully dressed stone. Archaeologically, such villages leave but little more than their ground plan marked in heaps of rubble where the wall had collapsed when the clay mortar was washed out. These heaps were once simple one-roomed houses in which most of the family property was kept in wooden chests. The bed was a boarded space lined with rugs. On the floor stood jars of water and drinking cups of wood and clay. Often there was a small stone-lined fire-pit in the middle of the floor, in which charcoal was burned; it was safest to use charcoal, in view of the thick straw roofs. Very often, cooking was done outside the hut in big pottery vases supported on stones around

a wood fire. There was always a special corner for the family digging-sticks, which were looked upon as sacred objects. Outside there were a few stone-built granaries, with thatched lids. These were food stores, too—some for the Inca, some for the Sun and some for the family.

Small villages were governed by headmen who ruled units of ten families, and were responsible for reporting to the Quipucamayocs all cases of death, birth, and details of crop production. Few of them knew how to tie the knotted string quipus for themselves, but they usually knew enough to be able to see that the record was correct. The heads over ten families were directly responsible to Heads of a Hundred Families. Each of these men usually kept a watchful eye over the welfare of several small mountain villages, reporting to the Inca nobles in the cities in cases of need. Sometimes serious outbreaks of illness demanded that food should be sent to aid the sick. Then the medical men from the towns would visit with their herbal medicines and magical incantations to drive the illness away. Sometimes a landslide might sweep away fields on a mountainside, and it would be necessary to call for labour from the towns to rebuild the field walls. Such work was often performed by the soldiers of the town garrison.

Towns in the highlands were not very big. They were principally centres for the Government officials, and places where markets were held, as well as the religious ceremonies at the new moon. At such times all the villagers flocked into them and enjoyed their day in

a town well built of good stones. They met and exchanged goods; at one festival in the year they brought in all the young people who were to be married, and held a group wedding. The regulation was that every young man of twenty-three or four who had finished his military service should marry. His bride was to be about eighteen or nineteen, and must be from the same tribe and district. That did not allow a very wide choice, but somehow the young people sorted themselves out and became married according to the law of the Incas.

The wedding festival was very gay. The Quipucamayoc tied the knots in his strings which recorded the number of households in each village. Then orders were given that a house should be built for each newly married couple, and that enough land on the andenes should be allotted to them for cultivation. When they left the town to return to their village, they felt no sense of being just poor farm workers; they were first-class citizens of the Inca Empire, equal to anyone outside the Inca family. To help them feel important and free, the beginning of each new planting season was started in Cuzco, where the Topa Inca and a line of the great nobles of the realm drove their digging-sticks of silver and gold and turned the first sods of soil in the plantations of the Sun. To work and grow food was a gift from the Creator of all mankind, to Inca and hill-side villager alike.

We are very fortunate that Peru possesses an almost complete country town of the Inca period. It was once well known, a fortress city above its fields, guarding a

river gap which led through the wall of the Andes into the great forests of the Amazon basin. This was Macchu Pichu, visited by the Incas and later the refuge of the last heir to the Inca throne. The Spanish saw it at the time of the final moves in the war against the Incas. Eventually the town was deserted. There was no need for it as a fortress, and after the wars, and the pestilences which followed them, there was plenty of room for the people of Macchu Pichu to move down to the valleys where they could live and grow their food in greater comfort. The town was left. Trees grew among the grass in its streets. All was covered over and forgotten, except that the Indians preserved a tradition of the old city lost on a hill top. Sometimes boys went hunting up there, and climbed over the stone walls without being able to see that they were in an almost complete town, so thick was the mountain-top jungle.

It was in 1908 that Professor Hiram Bingham heard of this ruin high above the gorge of the Urubamba River. He also climbed the precipitous rocks and crags into the forest. Sometimes there were sheer drops beneath, for nearly two thousand feet to the torrent below. Then, near the top of the crags, the stone walls began. They included passageways, square buildings, flights of steps, the rounded apse of a sun temple, then a clear space followed by a further group of walls on another crag. Enough was done on the first expedition, in partly clearing the ancient town, to make it quite certain that Macchu Pichu was truly Inca. The pottery found here and there was typically Inca, and the build-

ings were quite like the remains of the still finer palaces in Cuzco.

Two years later Professor Bingham was back again, and the site was fully surveyed and cleared. One house still retained its roof timbers and a thin layer of the original thatch. Very little was found in the buildings; the last people living up there had doubtless taken away all important things. The wet mists of the mountain top had caused the decay of all textiles and most wooden objects. So there were just unwanted pots and broken bronze knives, rattles and tweezers to be found. In a cave the explorers came across a mass of human bones which were the remains of mummies, probably of the town chiefs, which also had decayed, leaving behind only the dry white bones to be measured by scientists. There was very little soil on the site; if there had been, the Peruvians would not have built there at all, so there were no stratified remains to give a time sequence within the ruin. Nevertheless, a very nearly complete town remained there on the mountain top, just as it had been left three and a half centuries earlier.

The important thing about Macchu Pichu is that one can see the practical town planning of Inca times. There were andenes on all the possible slopes below the town, and stone staircases ran through them, just wide enough for a loaded llama to pass with a man leading it. The main entrances to the town passed through great boulders which made a natural fortress over the gateways. Between the houses the streets were narrow, with stretches of stone staircase wherever the trail became too steep for a level road (one can see something

of the sort in parts of the old town at Clovelly in Devon). The sun temple was in a commanding position at the edge of a plateau, where the nearly flat land gave room for a big open space for ceremonials. Beside it was a complete Intihuatana, a seat for the sun god. This circular enclosure centred around a short squared stone pillar with a step on one side—used to mark the days when the sun passed exactly overhead at noon. These occurred in February and October and were of importance to the priests, who were very good astronomers. To the ordinary people it was more important to observe the moon, because most of the festivals of their calendar were fixed by the lunar phases.

The buildings on the higher peak at Macchu Pichu included the fortress, with its walls arranged so that slingers and spear-throwers could strike downwards at an enemy; the walls were just a little too high for any enemy to leap up. The buildings below the fortress may well have been the Government offices of the town, but not a single knotted string quipu has survived the passing of time. This is a pity, because a group of quipus found together in one place might give us some clue to the meaning of the colours used on the strings. Without that piece of knowledge, the quipus add up to numbers which have no meaning for us. However, the prevailing winds in this region come from the east, bringing wet clouds and fogs from the great forests of the Amazon basin, so it is too much to expect to find string records preserved as they have been in the dry sands of the desert coast of Peru.

Macchu Pichu must have been a key town in the

system of fortresses which guarded the river valleys running down into the great forests of Antisuyu (the eastern region). Every now and again travellers discover one of these fortresses, built of carefully piled blocks of stone, on a clifftop overlooking the river valley. Such a place is the legendary city of Paititi, which remains almost inaccessible even in modern times.

But even beyond, in the fringes of the jungle itself, there were occasional stone-built outposts for Inca soldiers. These were dangerous places because of the devils which crept in silently at night and drove the soldiers mad with burning illnesses—at least, so the Peruvians described attacks of fever. Moreover, the Indians of the forest were not always to be trusted. They came to trade beautiful bird feathers and jaguar skins for pottery and cloth, but anything might suddenly upset these simple savages, and their anger would lead to their planning ambushes in the jungle paths, where every now and then an Inca soldier would be killed. Also, the Incas remembered that in the past there had been occasional raids by confederations of the forest tribes who came up the river valleys to kill and burn in mountain cities within the empire itself. So the defence system on the borders of the forest was very important and well planned; first the fringe of blockhouses, then the line of fortresses guarding each valley, and then the headquarters town with its narrow supply roads running out towards the frontier. Other roads ran inwards towards the great highway of the Incas.



# 5

## THE ROAD AMONG THE NATIONS

EVER SINCE the discovery of Peru by the Spaniards, the great roads of the Incas have been considered to be one of the wonders of the world. They originated in the common-sense notion that if the empire were to expand, there must be good and safe roads for the army to move rapidly from one place to another. The notion was easy enough, but when it came to be put into practice it involved some of the most stupendous civil engineering works ever contemplated by humans. The main north-to-south highway was more than two thousand miles long. It climbed mountain sides by long stairways, tunnelled through rocky spurs of the hills, edged along the sides of great precipices, leaped on swaying cable bridges across mile-deep ravines, and reached its distant goal safely.

Such a road would be a credit to any modern engineer with all the equipment of machines and explosives at our command today. The Inca engineers faced the problem with almost unlimited manpower armed with hammers, wedges and levers of wood and bronze. If they wished to bore a tunnel they would light fires against the rock, and then throw cold water on the hot surfaces to make cracks into which the bronze levers

could be inserted. In the worst places this fantastic road was five feet wide; on good safe ground it was twenty feet wide.

Every time the Inca frontiers expanded, the roads were continued through the new territories. The armies were made up mainly of ordinary young men kept for two to five years on duty, but one feels that there must have been a very highly skilled group of specialists directing the road-building works—a kind of Pioneer Corps of experts. The problem of the great swinging bridges over mountain ravines was not to be solved in the first place by the local villagers. Later on they would be responsible for caring for a bridge, and replacing the great cables of twisted osier twigs which held up the roadway; but the first building of such a bridge, to take the measured tramp of an army or the passage of a thousand loaded llamas, was something to be planned by experts.

First the route was surveyed. The bridge must be made at a spot where each side was at about the same level, and where the approaches of the road could be made safely. Once this was decided, holes were cut in the solid rock big enough for a man to crawl through. These were the eyelets through which the cables of the bridge would pass. If there were no suitable rock in the selected place, the builders would prepare the eyelets in a large block of stone and then anchor it by erecting a massive pyramid of heavy rocks above it to hold it in position. When the anchorages on both sides of the ravine had been made secure, pioneers would clamber down the sides of the ravine with a thin, strong cotton

rope. They would throw it down from one level ledge to the next until they came to the river, perhaps a mile below the bridge. Here came a call for bravery. It was too easy to be swept away by the torrent and smashed to pulp among the rocks, but the cable had to be taken across. Brave men would leap from rock to rock,



A bridge on the mountain road of the Incas

or try to swim from pool to pool across the river, helped as soon as possible by a string thrown from the party on the other side. They themselves also carried a string tied to the end of the long rope. Once over, the team of men to whom they handed their string would start heaving on it until they had brought the end of the rope safely over. All the time the men on the other side who had brought the rope down were easing its

passage so that it would not tear on the rocks. As its end passed the river, it was tied to a strong cord let down from above, and slowly it was eased up from level to level by teams of men. At last it was brought up to the level of the anchorages on the other side.

Meanwhile, the main cables for the bridge had been prepared from osier twigs, long and pliant, woven together like a gigantic cord some ten inches across, and perhaps two hundred yards long. One end of a cable was passed through the stone eyelet in the anchorage and bound secure. The other end was fixed to the cotton rope.

On the far side, every available man was ready at the rope for the tug-of-war which was to come. The home team lifted a section of the great coiled cable and edged it out over the edge of the precipice. The away team hauled on their rope, and slowly took the strain. It was important not to be too quick at this work. A sudden strain might damage rope or cable, and a rushed movement could easily tip a man to his death—not a nice death, either, for it took eight seconds' free falling before the final crash came a mile below. But gradually the rope was pulled in and gradually the great cable swung out over the abyss. Its weight increased as more and more of it swung free, but at last the end came in and could be passed through the eyelet and fastened securely. The cable was never pulled taut, because these Peruvians knew well enough that changes in the weather might make the cable shrink, especially as the twigs coiled up more tightly when wet. So to make sure that it could not break, they

let it hang over the ravine in a graceful shallow parabola.

Now all was ready for the next cable to be brought over. Probably we would ask skilled circus acrobats to walk over the cable carrying the rope back to the other side, but the Peruvian mountaineers had no fear of heights; a group of them would take the rope on their shoulders at intervals and walk over the single cable. The only preparation they made was to leave their sandals behind. Of course one could straddle the cable and edge along, but that was slow and one might be silly enough to look down and become dizzy, so they walked smartly down the curve and then up the other side with their rope. Once again the tug-of-war began, and the second big cable was taken over. This had to be more carefully adjusted at the far end, because it had to lie exactly alongside the first one. Two or three more big cables were pulled over and secured. Next about three feet higher, a lighter cable was placed on either side to act as a handrail, laced by cords to the main cables so that it was always within easy reach of the footway. The last thing done was to lay the footway of short lengths of boards running across the width of the cables. The bridges varied in width according to the importance of the road. But even two centuries after the Spanish Conquest many of them remained strong enough to take a stage coach across them.

By such tremendous efforts the Incas made it possible to pass from one spot to another within the empire more rapidly than any other people on the

boundaries. Food, supplies, armies, could all be moved rapidly and efficiently.

Down in the coastlands the ancient civilizations had also built local road systems, but the Incas made these into one unified roadway along the whole length of the coast. It was almost as difficult to make as the mountain highway, but for different reasons. The shallow river valleys had to be crossed by simple stone slab bridges and stepping-stones; the sandy drifts of the desert coast had to be swept clear over the fixed route, which was marked by great tree trunks set in straight lines beside the trail. But everything was faced by the Inca engineers as a problem to be answered for the honour of the sun god. There was no such word as "impossible"; they just went on with the work until they had succeeded.

We owe a great deal of our knowledge of the remains of the great coastal highway of the Incas to the archaeologist Victor von Hagen, who took the trouble to go to look for all the evidence for the route between the few well-known sections. He succeeded in tracing almost the whole of it. Then he followed up the clues of fragments of roads, the places of ancient ruins, and records of roads in the old chronicles. It was a matter of great patience and exact weighing of all the evidence, but in the end almost the whole of the Inca road system has been made clear to us. It was far more than the two great highways; in fact it was a network of crossing roads linking cities with one another, and making the natural highways of the river valleys easier for travellers. It brought the centres of the country

districts into the network of main roads, and to them it led the smaller roads and mountain trails from the farming villages and the high pastures of the llama-breeders. In fact the road system was as organic as the veins in a leaf, taking nourishment from one part to another. In some ways it was an even better-planned system than the Roman road network.

It was only after the discovery of the real complexity of the network of Inca roads that the stories told by the conquerors about the many millions of Indians in the Inca Empire seemed to become living facts. After the conquest, many plagues had swept the country. Since the Indians had almost no resistance to the diseases of Europe, the population was halved in the generation after the conquest. Then people settled in new areas, where the Colonial Government found employment for them at the seaports and near the rich mines of silver and gold. The ancient road system fell into disuse after a few years, and only the great main roads were kept open. The Spaniards had horses and donkeys, so the roads were not so necessary as they had been in Inca days when all traffic had been either on foot or else beside the patient llamas, who did not walk so fast as men. In the highlands the Indians retired into themselves, keeping apart from the white men as far as they could. They farmed only for their own needs, and did not use the ancient roads for carrying supplies for the Sun and the Inca. Everything was changed to such a degree that only the patient work of an archæologist travelling through the

ancient pathways could open a picture of the colourful and crowded past as it had really existed.

In olden times the great valleys of Peru were fringed by small towns and villages all the way up to the mountain plateaux. Every two or three miles along the roads were rest houses for messengers, and stores of food and clothing for distribution to the army or people in distressed areas. The roads were not empty stretches between towns, but were constantly busy in the easy-going Peruvian way. Llamas could not be hurried, and they were the real means of transport for most things. Every mile or two the llama convoys would decide to sit down, and there was no moving them until they felt ready. When the leading llama, who wore bells on his harness, would tinkle up on to his feet, all the others would do the same. The Indian drover in his bright tunic and coloured headband would roll himself another pellet of coca leaves from his wallet, and as he started to chew he would shuffle his tired feet into his sandals and move along at a steady jogtrot for another short stage beside his llamas.

A llama could only carry about seventy pounds, so there were many of them in a big convoy of goods. They were used for carrying bales of cloth, wooden boxes, pottery, bundles of foodstuffs and so on from one town to another. They brought the farmer's goods to the market, and his taxes to the storehouses of the Inca and the Sun.

Other roads users were the Chasquis, who ran with messages from one town to another, or to Cuzco with news and valuables for the Inca. These were highly



trained runners who would run with their messages or basket at top speed, for about two miles to a rest house. There the packet would be handed on to another runner, who would set off on his own two-mile course. There was no break in this service, and by this means the Inca could eat fresh fish which had been caught in the ocean the day previously. More importantly, he could be given a message knotted in a quipu about events a thousand miles away within three days. By such means the Central Government in Cuzco was in constant touch with all the empire. Of course news of expected events could be sent more quickly by means of smoke signals from selected hill tops by day and beacons of fire at night. This was just the same system by which Queen Elizabeth I, in London, heard of the defeat of the Spanish Armada. However, the Peruvian Chasquis carrying their knotted string records were the equivalent of the European dispatch riders. True, the dispatch riders had horses, but the Inca roads were incomparably better than anything in Europe at that date.

The most brilliant sight on the roads of Inca Peru was the cortège of an Inca when travelling. First would come squadrons of soldiers in the chequerboard-patterned quilted tunics and polished copper helmets with fringes of feathers. Then groups of officials, carried in litters supported on the shoulders of runners. These officials would be gorgeously dressed with badges of their office decorating their head-dresses. Their runners would wear special uniforms. Then, with a special guard of red-dressed warriors and runners of



The Topa Inca in his travelling litter

noble birth with bright tunics and great golden ear-discs, would come the Inca himself, riding in a brilliant coloured and gilded throne under an umbrella of coloured feathers. The throne would be supported on long poles with eight runners at either side. If a runner slipped he would be replaced by another, and then killed; there was no room for inefficiency or accident in the service of the Inca. Following the throne would come more officials and the ladies of the court riding in covered litters. These in turn would be followed by servants carrying loads of cloth and bundles of specially selected presents for the cities which the Inca was going to visit. The whole cortège would pass along

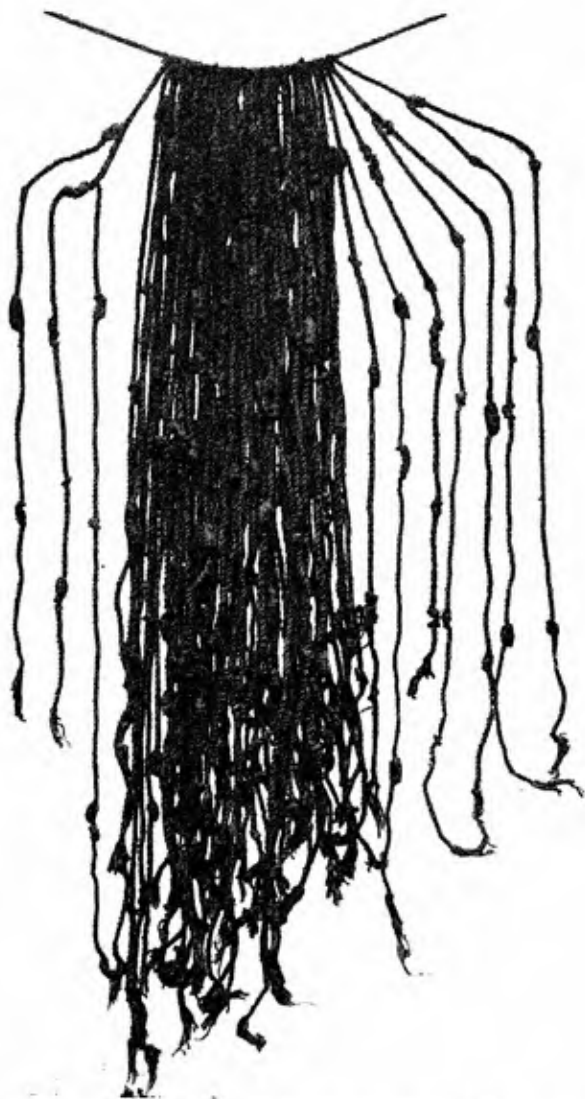
glittering at a steady jogtrot of about five miles an hour. No Peruvians would walk on a journey. They found it easier to keep up this steady even trot, and it is so if you have the wiry leg muscles of these people of the high mountains. As the cortège passed towards a village or town, people would rush out to line the streets and call out blessings on the Inca, but as soon as he came in sight they would become silent and throw themselves on the ground, not daring to look up to see the face of the Child of the Sun.

The people met the Inca face to face only when he was safely installed in one of their towns. Then there would be ceremonies and much feasting from the stores reserved for the use of the Inca. Presents would be given to the governor of the town, and special gifts of local workmanship would be brought to delight the Inca. Then the people could flock into the square before the Inca's throne to perform the dances and sing the traditional songs of their tribe.

There were few surprises for the Inca in any Peruvian town. He would know all about the national costumes of the people from their dress at the festivals in Cuzco. As for the towns, he had exactly carved relief maps which showed the size and position of every building in them. It was policy to make these tours, because the people of recently conquered tribes saw that the Inca was not unwilling to stay among them, and that he really treated them as full citizens of the empire. It was a great factor for unity. They probably also felt very happy because he did not try to interfere much with their local way of life. Only people who



Two wooden *kero* (beakers). The one shown above represents the sacred puma with a condor-head tail. The one on the left has butterflies and flowers. (Photographs: Ferdinand Anton, Munich.)



An ancient quipu recording numbers running into tens of thousands. The triple string on the left reads:  $5 + 90 + 400$ ,  $7 + 40 + 100 + 5,000$ ,  $6 + 30 + 000 + 7,000$ , which means 495, 5,147 and 7,036 in our notation. (Photograph: British Museum.)



Three Inca pottery vessels with similar painted designs. (*Above, left*) an aryballus (these were made in sizes from six inches to three feet high); (*right*) a small jug, and (*below*) a two-handed bowl. (*Photographs: Ferdinand Anton, Munich.*)





Smaller Inca pottery: a "kettle" representing a puma with open mouth; and a small ladle with paintings of llamas. (*Photograph: Ferdinand Anton, Munich.*)



had official business with the Inca authorities needed to learn the Quechua language. The gods of the tribes were respected, and were even housed in the little temples around Ccoricancha in Cuzco. Only on certain festivals the Inca's governor led the people in the worship of Inti, the sun god. Otherwise all was well. Nobody was allowed to wear gold any more unless he had been adopted into the Inca family at least by marriage; but in any case only a few nobles in any province had been able to wear gold. In fact, in most cases the provincial nobles still retained their offices, and the chief himself was confirmed in his position and often married to an Inca lady. The whole business of government under the Incas was made as friendly and easy as possible. That was not only the most sensible way, but also the cheapest in manpower.

It was always easy for the Inca to know if anybody were plotting against him, because there were Inca officials in every city of the empire. Also every different tribe wore its national costume with a distinctive head-dress. If the officials noticed an unusual meeting of people from different tribes, they immediately began to look for the reason. It might be nothing more serious than arranging for a festival display of each other's dances; but, on the other hand, it was impossible for any single tribe to hope to defeat the Inca power, so meetings between different tribes *might* indicate a plot. Sometimes there was indeed a plot, and an actual revolt. This was usually due to some foolish oppression by an Inca governor. Perhaps the revolt reached the point where a citadel was stormed and a



governor killed. In such a case the Inca army moved in. If the rebellious tribesmen gave in quickly they were often pardoned, but the tribe would be divided. The law was that the Inca could move his subjects to any part of the empire just as he wished.

The law about deportees was very good. No person from the hot lands was to be sent to the high cold lands, and no highlander was sent to a hot climate to live. All were placed where they could live in the way they were used to. Families were not broken up, and in the new settlement they were given as much land as they had held before. The usual thing was to take people who had been obedient and friendly to live among tribes which were unfriendly, and to bring some of the unfriendly tribespeople to live among the more settled peoples. Such colonists were called *mitimaes*, and they were treated with kindness. For the first two years of their exile they were exempted from all taxes so that they could make their living more easily while they settled down in their new homes. Nobody pretended that it was a nice thing to be taken from one's familiar mountain valley and sent to another one hundreds of miles away, but in time the new valley became "home" and the settled villagers happily paid their taxes again to the Inca and the Sun. The people who had wanted to revolt heard all about the benefits of the Inca rule from the more settled people who were now living among them. The empire was just that little bit more united and at peace. Yet the two tribal groups remained separate, and were made to keep their distinctive tribal dress. The Incas had not yet discovered the

Roman idea of gradually making all subject tribes part of one imperial nation. But wherever they were, the leaders of each group of a tribe were made responsible to the Inca governor. There was no attempt to do anything more than replace a hostile leader with a friendly one from the same family. In fact, the Inca policy in these matters was more humane than anything the world can show today.

One of the most difficult of all problems faced by the Inca Government was the protection of public health. Epidemics of illness were watched, and movement of people and llamas into and out of the danger area was restricted. There was no sewage system in the towns, but each household kept its sewage in big covered jars which were taken out for use as manure in the fields. Among the villagers the same was done; the human sewage used as fertilizer was dug into the ground day by day, and thus never became a nuisance or cause of disease. The Inca system included a rudimentary medical service with its specialists in setting broken limbs and trepanning skulls and so on. But usually, doctors were simply people who were interested enough to learn about the properties of herbs and how to use them to help their neighbours. They were rewarded by presents of food and cloth to make up for the time they used up while acting as doctors. There were always women in towns and villages who specialized as midwives, and who were not only rewarded with presents but also had a small extra allowance of cloth and foodstuffs from the Inca's stores. It

was all very well organized, like everything which the Incas took in hand.

The one tragic mistake which brought about the fall of the Inca Empire was made by the eleventh Topa Inca, the great and brave Huayna Ccapac. He had conquered the kingdom of Quito, and for the first time brought the Inca Empire to the Equator and a little north of it. To seal the conquest with friendship in the traditional way, the Inca married the daughter of the Scyri of Quito. He had the unusual misfortune to fall in love with this lady. His son by the Ccoya, Huascar, was the true heir to the throne; but by the beautiful princess of Quito he had another son, Atahualpa. Huayna Ccapac thought that it was possible to separate part of the Empire of the Sun. He planned to have Huascar succeed him as Topa Inca, and to give Atahualpa a separate kingdom of Quito, with an equal rank as supreme Inca. No doubt he had forgotten the prophecy that linked the Incas with the succession of the twelve moons of the year. Huascar was to be the twelfth and last Topa Inca.

After the death of Huayna Ccapac, Topa Inca Huascar was placed on his throne, and he was unwise enough to let his half-brother live. Atahualpa set to work to seize his part of the inheritance, with the help of two Peruvian generals, Quizquiz and Chalcuchima. He managed to hold off the Topa Inca, and then in a sharp campaign spread through four years he achieved control of the whole country. He seized the Topa Inca Huascar, and had himself acknowledged as true Inca by the High Priests. At this juncture the Spaniards

landed. Atahualpa seized the chance to remove all internal opposition by having Huascar murdered. For all the bravery of Quizquiz and Chalcuchima, the country was left without an Inca; the system had collapsed. The twelve Incas had reigned for nearly five centuries. The false Atahualpa was captured and killed. The Spaniards, learning of the true state of affairs, hunted down the two princes who could have claimed the rights to become Topa Inca and killed them. After that, the members of the Inca family no longer presented a danger to their conquerors, and a number of them, including the father of Huaman Poma de Ayala, were ennobled with Spanish titles which made them grandees under the new empire of Spain. As it was with the Inca roads, so it was with the political organization: once the Topa Inca was gone the whole elaborate system fell into ruin.

# 6

## THE FISHERS OF THE GREAT OCEAN

ONE OF the most remarkable feats of Inca organization was the successful holding of the people of the Chimu kingdom within the Inca Empire. The Incas and the highland people in general detested the rich, luxury-loving lowlanders. Still more they disliked the climate. They found it made them as lazy in the heat of the day, as any Chimu prince might be. Moreover, the air pressure near sea level together with the high temperatures and extremely dry air gave them headaches and sore throats. Yet in spite of all this, they kept their officials in all important towns, and won the respect of the lowlanders. For one thing the Incas arranged to become involved in the worship of the creator sea god Pachacamac, by making it quite clear that he was in fact their own great creator Viracocha. They made great offerings at his temple, and often paid state visits. The heart of the Chimu kingdom long resisted them; but, by careful bribery and friendly conduct to the Chimu chief and his gods, the Incas were able to hold their position as overlords.

The capture of the Chimu kingdom was made by the great Topa Inca Tupac Yupanqui, who was one of the greatest organizers of the Inca Empire. It is said

that he was so bold that he went on a great sea voyage in balsa rafts, and after visiting some strange islands in the great ocean returned home after being away for nearly half a year. There is no reason to doubt the story, because Tupac Yupanqui could well leave the government in the capable hands of his son Huayna Ccapac. Only recently the explorer-archæologist Thor Heyerdahl proved that a small balsa raft made in the ancient way could be navigated across the Pacific as far as the Tuamotu Islands from Lima in Peru. The people of the Marquesan Islands also had a tradition that their ancestors had once made a great sailing canoe which had visited a great mountainous continent and safely returned across the Pacific to their home.

Most of the Chimu people were fishermen. They built fine towns, and irrigated what fields they could near the river mouths of their desert coastlands; but, naturally, they were forced to rely mostly on the sea. The great south Pacific current of cool water swept northwards along the coast of Peru, bringing an almost inexhaustible supply of fish of all kinds from giant rays and sharks to masses of little fish not unlike sardines. These fish were preyed on by innumerable sea lions who lived among the rocks and cliffs, where ridges of rock ran down into the ocean. There were pelicans and innumerable cormorants and gulls who made the rocks white with deposits of guano. The sea edge swarmed with crabs and all kinds of shellfish. This was a rich world for fishermen. Yet they were haunted by the sun. In the heat of the day, the desert coast shimmered in the heat haze, and people hid from

it in whatever shelter they could find. No wonder they could not understand the Incas who worshipped this terrible sun. When at midday Cuzco was busy with activity, the Chimu capital Chan Chan was silent in the heat; a silver haze softened the brilliant frescoes of the mud-brick houses, and people lay resting and longing for a breath of cool air under their gaudy cotton coverlets. Chan Chan awoke in the late afternoon for business, and many people worked by moonlight or the smoky glow of tight-bound reed torches. Wood was too scarce to burn if one could avoid it.

Chimu houses were simple courtyards like the Inca ones, but built of sun-dried brick. The roofs were of reed thatch, held in place by a few twisted wooden supports from the small trees which grew on the fringe of the cultivated river valleys. Poorer people often lived in shacks made of reed mats stretched round a simple wooden frame. When the Incas marched in, they found fortresses made in terraced mounds like their own, but these were not made from stone. Instead, a natural rising ground of rock was covered by millions of tons of brick facings to give it the necessary shape and strength. It was the same with the temples. No fine stone constructions like the Ccoricancha were to be found in the whole of the coastlands. Instead the temples were step pyramids of brick. One great brick mound stood on another; there were usually six or seven stages, not very high or steep, but adding up to a hundred feet or so. Up one face ran a broad stairway to the sanctuary on top. All the faces of the pyramid were covered with a lime cement which was

painted in gay colours with symbols of the gods. Then at the top came the holy house of the god, usually a little mud-brick hovel with a cane matting roof. The Inca was horrified when one of the great gods was shown to him. Instead of a glittering image of gold or even porphyry, the divine image was a crude wooden post carved with a simple face rubbed over with red paint. That it was already more than a thousand years old did not matter to the Inca; he felt it was a sad strange thing that the images of the gods should be made from so ordinary a material.

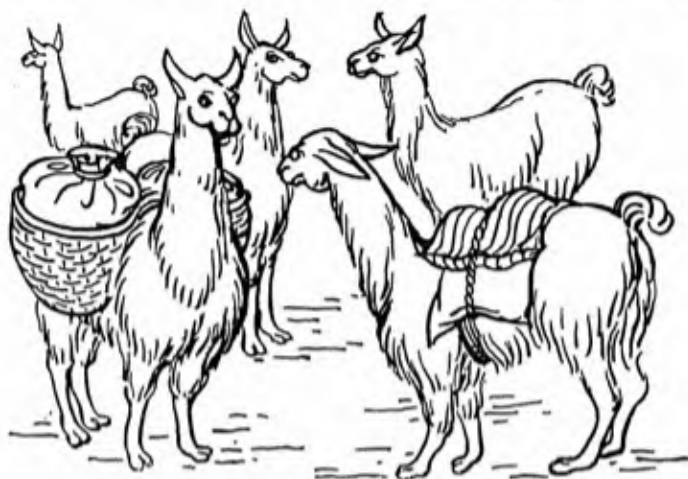
The great festivals of the coast people were, however, very brilliant and gay. They used more feathers than the highlanders, and were skilled in working silver and gold, so that everyone could appear in glittering metal ornaments. Some wore shirts covered with little fish made out of sheets of silver. Others had little moons and circular discs of alternate silver and gold. Their ear ornaments and cloak pins were shaped in openwork filigree to give elegance and glitter. On such occasions the image of the god was wrapped in feathered robes and brought down the steps by the priests to be enthroned among the people, who danced and sang in his honour. True, he was an ancient oracle; but they were singing the praises of the bringer of fish, the giver of sea-lions, the breath of life on the waters. Somehow it was much more primitive than an Inca festival, but it was also much more free and happy. The god was part of the nation, and not a great outside force.

Perhaps the greatest shock for the Inca invaders was



at the spring festivals, when the young people came out at sunrise. No one had a scrap of clothing, and as the sun tipped the horizon they ran in one wild scramble to get to the temple steps. As they scrambled up the steep slope towards the temple they sorted themselves out into pairs, and the boy and girl who first reached the house of the god hand in hand were supposed to bring blessings on the people. They were honoured as priest and priestess of the growing crops, and married there and then. To the Chimu, this was a wonderful thing which symbolized the union of human beings with the whole of Nature, and all youth with the springtime. But the Incas were not attuned to nudism in their grey plateau among the clouds, and their gods were very stern and golden beings; so they did not attend such festivals of the lowlanders, even though they were unable to stop them.

Even the llamas of the Inca homeland could not live long in the hot coastal countries. It was all too strange for them to survive. Air pressure was high, and the heat and dryness killed the poor animals. So nearly all the traffic on the great Inca highway through the sands was carried on the backs of men and women. On morning and evening journeys the convoys of porters trotted along the roads, supporting their bundles by a tump-line round their foreheads, just as the highland people did. Everything was carried in this way, from bundles of raw cotton to large jars full of the local drinks. Notables, of course, were carried about in their fine litters, just as the Inca noblemen were carried at home.



Llamas with loads ready for a journey

One of the real charms of the coast for the Inca was the delicate fish food. The Chasquis used to send fish by relay race up to Cuzco, and the Inca enjoyed it as a particular pleasure from the richest and strangest province of his empire.

The Chimu people used many methods in fishing. No doubt much of their skill was traditional. People had been fishing with hook and line from that coast at least four thousand years before. We have plenty of pictures of Chimu fishermen from the modelled pots which they left behind in their graves. We see them seated in their little boats made up of two or three big bundles of totora reeds tied together. Over the side they lower their hooks on a string without a rod. Sometimes they hook a shark as big as their boat, sometimes

a more peaceful flatfish. These dawn-and-dusk fishing trips must have been quite pleasant occasions while the weather was fine, but in storms there was danger of the little reed boats being driven out to sea so that they would become waterlogged and lost. One could not take such a boat out for many hours at time without having to hurry home to dry it out before going off again. Some fishermen even seem to have made themselves little huts out of several of these reed boats with the thick ends standing on the ground and the narrow prows curving over to make a pointed roof.

The Chimu kings were the heads of a very rich community. Their traders took all manner of goods up and down the coasts of Peru and Ecuador. It was easier to take a big load on a balsa raft from one port to another than to take the same amount of goods in bundles on the backs of hundreds of porters; it was cooler, too, to travel on the sea. Many of the great trading balsas were ships of considerable size. Among the first Peruvian vessels met by the Spanish invaders was a trading balsa going along the coast of Ecuador with a cargo of cotton, pottery, silver and gold vessels, jars of chicha drink and bundles of woven cloth. The crew of forty men and women included a merchant and his carriers. Though it rode low in the water, it was as big as any of the little ships which Pizarro had been able to obtain for his great adventure.

A balsa raft was a very cleverly worked-out vessel. It could be made to any size needed; in fact, it was adjustable, and could be enlarged by adding extra timbers at the sides. If treated properly it would float

for a year or so before it became so waterlogged that it was advisable to take it ashore for drying out. This business of becoming waterlogged had long been a problem for archæologists. Acquaintance with the light dry balsa wood gave the impression that it would become waterlogged very quickly, and there was absolutely no record of any special treatment of the timbers and no evidence of them having been painted over with waterproof mastic or anything else. The problem was solved in 1947 by Thor Heyerdahl, who, wishing to build a balsa raft for himself, experimented with fresh logs still containing the natural sap of the trees. They were a little heavier than dry balsa wood, but they remained free of sea-water over the whole of his long voyage.

The first step in building a balsa raft was to prospect very carefully to find a group of trees all about the same height and thickness. The raft-builders cut them down with their small bronze axes. The wood was soft, and this was quite a help, because it did not blunt the soft edges of the axe-blades. The fallen trees were not left to season, but were quickly stripped of branches and bark. They were then carried down to the workshops near the sea where the craft would be put together. The logs were arranged with the butt ends together and the tops closed a little, to make a kind of prow to the raft. They were not tied tightly together, but the cane ties which bound them left a little space between each log. By this means the raft was made flexible, so that it could bend a little when riding heavy waves. It also allowed water to splash in and out

between the balsa trunks, so that the raft was never filled with water. Across the trunks two beams of wood were laid, tied only at the end. On them a platform of light planks was placed, supporting a cabin covered with mats. In this way the cabin floor was kept fairly dry above the waterline. The purpose of the cabin was to give shelter to passengers, as well as to protect perishable merchandise. Other goods such as bundles of pottery and sealed boxes were piled near the middle trunk of balsa wood. On the outer logs were pegs holding a rope to support the members of the crew when they sat there to propel the great raft with six-foot-long wooden paddles. From near the middle of the sides of the raft two long poles were set up, which crossed about twice a man's height above the deck. From the crossing a yard-arm holding a square sail was slung. Guy ropes held the double mast in position, and there were other ropes to slew the sail round to catch the winds. This was a Peruvian invention, and the only sail used in the whole of the American continent.

The balsa raft rode only on the surface of the sea. It was therefore at the mercy of the winds unless it had some special method of steering, and so the Peruvians worked out a system of "centre-board" steering. Centre-boards were planks about the height of a man, and nine inches broad, about an inch wide at the back and tapered to a thin edge along the front. At the top was a carved handle. Ten or twelve of these boards were pushed between the logs of the balsa. When they were all up the balsa would skim across the waves with the wind and even go sideways. When the boards at

the back were pushed down, they steadied the course of the vessel so that a wind coming from the side could still be used to drive the ship forward, and not push it lightly across the water in the wrong direction. One could also adjust the centre-boards fore and aft so that the ship could be turned, either into the wind or to run before it. By this means the Peruvian navigators were able to guide the apparently clumsy rafts up and down the long coastline.

It was only in 1953 that careful excavations were made in the Galapagos Islands by Thor Heyerdahl and his companions. They found a number of ancient Peruvian pottery vessels, mostly from Inca times but a few from a thousand years earlier. It seems evident that the ancient balsas were able to navigate five hundred miles out to sea without any great difficulty. Heyerdahl's *Kon-Tiki* voyage of three thousand miles to the Tuamotu Islands was final proof of the seaworthiness of the balsa. It had long been known that there were native traditions in this part of Polynesia about a great king who came on rafts with many people from the west; it may be that this referred to the famous voyage of the great Inca Tupac Yupanqui, but so far no archaeological check has been found.

If the *Kon-Tiki* raft had sailed from the North Peruvian port of Tumbes, where Pizarro first landed on the mainland, the journey would have brought the raft to the Marquesas Islands. It is from the Marquesas that we have the ancient story of the giant canoe which was launched seventy generations ago to sail to the land of Tefiti, which was almost certainly the mainland of

South America. The probable date of this journey would be about A.D. 900, before the time of the Incas. The Marquesan story as recorded by Handy in 1923 is so circumstantial that it is hard to find any explanation except that Polynesian voyagers really visited Peru. Thus it seems certain that the remarkable voyage attributed to Tupac Yupanqui was perfectly possible in practice.

It is probable that on some such voyage into the oceans the Peruvians introduced the sweet potato into the islands of Polynesia. Whether they were responsible for introducing the centre-board method of steering bamboo rafts to the native peoples of Formosa is a matter for conjecture. It may well have been that a balsa raft was taken so far only by a Spanish ship in the middle sixteenth century. We have no record to show when the Formosan tribes first used this method of navigation.

We have no evidence at all of any Peruvian balsas having travelled north of Ecuador. When Pizarro and his associates Almagro and Padre Luque met in Panama, they heard native stories about a wonderful land of gold far to the south; however, they could find no one who had travelled there, and they saw nothing which was said to have come from that mysterious southern land. Later on, when Pizarro touched in at the coast, he found only swamps and wild jungle as far as the island of Gallo. He found several villages of Indians who wore a few ornaments of gold, but they had only small canoes, and were in no sense civilized. It seems clear that these long desolate coasts of tropical

rain forest discouraged the Peruvian navigators from searching for trade in that direction. To the south they penetrated to the coast of Central Chile, but that was only with the advance of the Inca armies into this almost empty desert.

Inca travel inland does not seem to have left any traces north of Ecuador. As we know, they were in contact with the wild tribes of the Amazon forest, but there is no evidence that they attempted to explore the river valleys. Farther south, Inca fortresses were constantly on the alert against invasions by the Diaguita confederacy of tribes in north-west Argentina. These people built small towns of stone houses, and made very good bronze weapons as well as fine pottery which often imitates Inca styles. They were great warriors, and having captured a young Spaniard from a ship in the La Plata estuary they carried him on a raid into the Inca Empire before it was discovered by Pizarro. It is said that these Diaguitas introduced the domestic fowl into Peru, but it seems more likely that this bird reached Peru some centuries earlier across the Pacific.

It seems certain that if the Inca Empire had not fallen to Pizarro, there were only two lines of expansion open to the Peruvians. Probably they would have moved southwards and absorbed the Diaguita, and this would have opened up the Pampas of Argentina, with their almost inexhaustible flocks of guanacos, as well as the open parkland of the Paraguayan Chaco. This was not richly populated country and would have served as a reservoir to take the crowded population from parts of Peru itself. In the north, after the fatal



conquest of Ecuador, the Peruvians would have found an easy mountain way to the rich gold valley of the Cauca River in Colombia, and to the great plateaux near Bogotá where the empire of the Chibcha had its centre. We know that the Chibcha raided as far afield as British Guiana, so we need have no doubt that the Incas could have reached the shores of the Caribbean. However, this was not to be. The fatal mistake of Inca Huayna Ccapac led to the sealing off of the empire in Ecuador, and its division, in the very year in which Pizarro had landed. If the empire had remained united it may well be that Pizarro would have been defeated and killed, but there is no doubt that Spanish adventurers would have come pressing upon the country from the north, where they had captured the Chibcha Empire, as well as from the south, where they had entered Paraguay. The Pacific would have been filled with adventurers seeking their share of the gold. Whatever happened, the Inca Empire was doomed. It is perhaps less tragic that the last true Topa Inca was murdered by his half-brother shortly after the arrival of the invaders from the sea.

# 7

## KNOTTED STRINGS AND PAINTED BOARDS

AFTER THE fall of Peru, the Spaniards needed to know what was produced by the people of the country which they had captured so suddenly. Most of these men were soldiers with no knowledge of how to organize a government. They tried to keep part of the old system, so they took their records down on paper from the dictation of the Quipucamayocs who read the accounts from their records of knotted string. Some of the Spaniards have left us records of how numbers could be read from the strings, but not one has told us clearly how to understand what was meant by the colours of these quipus.

It is even worse with the other kind of Peruvian records, the painted wooden boards. Huaman Poma de Ayala tells us that, as a child, he saw the painted boards on which were depicted the history of each Inca—but, alas! these boards are completely lost to us, though we know that they were probably very much like the wooden beakers called *keros*, of which a few specimens still survive. These *keros* are often decorated with human figures and patterns, made with



The Quipucamayoc with his records

mastic. The wood has been cut into a little way with a chisel, and smoothed by scraping, into the shape of a part of the pattern, such as a face or a flower. This shallow space was filled with coloured mastic. Mastic is a natural gum drawn from a bush; it is a clear liquid and dries by contact with the oxygen in the air in exactly the same way as the more delicate Chinese lacquer. This mastic could be mixed into a paste with mineral powders of any colour. The coloured paste was pressed into the hollow in the woodwork, smoothed

down and allowed to dry. When every part of the pattern had been filled with its appropriate colour and dried, the whole vessel was polished over with fine sand and leaves to make it smooth and glossy. Such a vessel was very beautiful, and was a treasured possession in the home.

In ancient times these keros were used for pouring out offerings of drink to the gods. Today, after four centuries, their colours are still distinct, though often dimmed by the dirt from many generations of human hands. Such paintings would be invaluable for keeping records of the kind described by Huaman Poma, but not one of them is known to exist today. Perhaps in some museum or old castle in Spain, Austria or Italy a piece may be found remaining from the treasures of Peru which were sent to the Hapsburg Emperors.

There are many of the string quipus remaining today. All come from the coasts, where they have been buried in the dry sand with their former owners. Not a single one comes from the highland homes of the Incas. At first sight they look like jumbled masses of unpicked knitting wool. They have to be carefully spread out, and then it is seen that they are made of a top string of coloured cotton, from which finer strings hang down. Each of these finer strings is tied into knots at several different levels. Each knot is made of a number of turns of string around the central cord; the turns vary in number from one to ten, so confirming the Spanish account of the quipus which insists that a decimal system was used in counting by the Incas. It appears that the knots nearest to the main

string are the units, the second row of knots are the tens, the third are hundreds, and the fourth are thousands. Sometimes the smaller strings are of different colours and obviously deal with special parts of the account, but we have no means of knowing what they actually mean.

The only quipus which have been certainly read are two in Paris which were analysed by the late Baron Erland Nordenskiöld. The numbers recorded on these proved that they were definitely astronomical. They recorded the apparent movements of the moon and Venus, so that we can be sure that Peruvian astronomers were good at their work. Of course they had no real thought for people so different from themselves as we are; their intention was to leave an accurate record of their observations for the future. They were thoroughly scientific in their careful and patient routine recording of what they saw in the sky. It was quite clear to them that the records of a thousand years might be required to check off the movements of the planets so well that they could predict exactly which planets would be visible in the sky on any given night. They were also able to predict eclipses of the sun and moon, so they must have kept a very good record of these events to find the rhythm of time in which the eclipses could occur. To record such things, with their long mathematical calculations, the quipus were ideal. Each detail could be counted up exactly in its place, and added on to the next step of calculation on the following string.

Most of the quipus which have come down to us are

from the coast, and some of them date from five or six centuries before the Incas came to Cuzco. This proves that schoolboys in Peru were tying their sums in knots long before the Incas organized a school system.

There was indeed a school system in Inca Peru. Just as girls were sent to the House of the Virgins of the Sun, boys were selected and sent to schools where they were taught the mysteries of the quipus by wise elders. Of course, all boys of Inca blood were sent for schooling, because their position in the Inca state demanded that they should understand how records were kept and how the government of the country had grown; but the Incas depended so much upon records being properly kept that many thousands of other boys were trained as civil servants, who would have the responsibility for seeing literally that no knot was left untied in the strings of government. Father Calancha has left us a record of one school exercise in historical quipus: "Record the following history. There had been nothing before the first Inca Manco Ccapac. In his reign in the fourth year he captured ten provinces, killing many enemies and losing three thousand of his own soldiers. He gained ten thousand hand-fuls of gold and thirty thousand of silver."

From the rather confused account which follows, we see that a black cord represented time. To this were tied some unbleached cords scattered with irregular knots. (Time was passing; nothing important was recorded, and numbers were uncertain.) Next would come a red knot. (The Inca: one guesses that since this was the first red cord it meant the first Inca, Manco

Ccapac.) In the red cord a knot of four turns would be made. (Year four of the first Inca.) To the last knot a brown thread would be fixed with a knot of ten turns. (Ten earth districts added in the fourth year of the first Inca.) Then Father Calancha goes on to say that to the brown knots green cords were added, but no quipu is known with so many off-branches. It may well be that we should have returned to the black cord of passing time. The green cords were added next. ("Many enemies" would be expressed by a number of scattered small knots without placing.) Then Inca troops killed. We are not given a colour clue here, so let's guess: red for the Inca and white for dead men's bones, so a red-and-white cord is added close to the green one, with no knot in the units place, no knot in the tens, no knot in the hundreds, but a knot of three turns in the thousands place. (Three thousand Inca men dead.) The captured silver was a white cord (a triple knot in the ten thousands place); the gold was possibly a yellow cord (one knot in the ten thousands place). We now have a problem: a festival day was declared for the Sun. (Let's guess again: Sun, gold, Inca, red; one knot in a red-and-gold cord on the time cord.) But maybe, as in some real quipus, a good deal was shown by whether the lesser cords were above or below the main cord.

The Inca-period schools were not easy places. The children were responsible for the cleaning of the school, and life was made as hard as possible for them so that they should be able to face difficulties more bravely in later life. One gains the impression that a

great deal of learning came simply through fear of the lash of the master.

For the higher pupils, those of Inca blood, the training was conducted by a special class of wise old men known as Amautas. These tutors directed the whole life of their pupils, giving them wise advice and teaching them of the ancient wisdom of the kings and priests of past times. The Amautas even acted as judges of their pupils' progress in the great examination of their ability as skilled young warriors. This examination was something like a modern training course for comandos. It took place in the year when the candidate was sixteen, and lasted from one new moon till the next. They had to show their strength in wrestling and running. There were fights with shields and clubs, and though the clubs had no stone or bronze mace heads on them they were still dangerous enough to kill if one received an unlucky blow. The most difficult ordeals were journeys made without food for five days. The candidates wore only coarse tunics, and were allowed neither sandals nor bedding. There was no easy way to become a warrior; the whole course had to be passed to the satisfaction of the Amautas. If a boy failed, it was a disgrace worse than if he had been killed in a mock combat. So severe were the judges of this ordeal that only once was the heir of a reigning Inca chosen as the best of all the candidates in the examination. This was the great Tupac Yupanqui.

On passing their ordeal the young men were cleaned and dressed in white. They were then brought before the Inca, who made a long speech, and then





Women weaving and working beside their homes

commanded them to be brought to him one by one. As they knelt at his knees the Topa Inca pierced each of their ears with a golden pin. This was allowed to remain as a sign that they were accepted as good members of the Inca family. Little by little the holes in the ears were enlarged until they could take the full-sized ear-plugs of grown men.

For girls there was little education in Inca times. The object of their life was to be wives. The career girl was an impossible nightmare to Inca thought. Hence even the Maidens of the Sun were not taught about state organization, but were busied with spinning, weaving and embroidery. Because they specialized in such work, they became very skilled. The cloths which they wove were the best in the empire.

Such skills were not for the ordinary girls, who had to do their weaving in between pot-making, cooking, looking after their little brothers, and all the domestic bothers which fall to girls in primitive society. They were not even allowed to have a say in the choice of their husbands. When they were of the right age, the town authorities told them who they should marry, and what their allowance of material for household use would be. They were given two years' exemption from paying taxes after the birth of each baby. The Incas realized that a busy housewife cannot do extra work while tiny children are crawling around her feet—and, much more than all the taxes, the Incas wanted to have more Peruvian citizens growing up happily. That could only be done if every child in the empire was welcomed by its parents. The freedom from taxes

for two years was a great help to making people happier and more comfortable in their lives.

The Incas had a wonderful set of names for children at different ages: Infant in the cradle, Learning to walk, Those who play, Big Boys, and Girls who begin to grow up, and then Young People. At every age the taxes were altered, but as the family paid more of their produce to the Inca and the Sun so their allowance of land was increased. It was all managed by the state, and it seems that people had very little freedom, yet in studying the old reports of the *conquistadores* it seems that the people were happy enough. It is very likely that the laws were used for the benefit of the families in the villages. For example, if a son married, his land was kept with the family land, and his house was made in the same village. The same kind of freedom was allowed in the matter of the tribute payments, since the people responsible for all the reports and for the collection were local people. In this way the Inca ensured that their empire was not a foreign oppression, but a natural part of the lives of the people.

Quipus were used as a means of checking on everything which people produced, but there were just as many quipus which recorded payments to people in distress and to the helpless and afflicted. Again, there was no special office to help the maimed and blind, but the local officials had to account for them and grant tax allowances according to rule. They also had to see that the special gifts from the stores of the Inca were properly distributed to those in need. Everything was recorded, but it all depended upon the local people

whether the Inca system worked well or not. Occasionally they might be visited by an Inca official who would have the quipus brought out and question the people about the facts behind the figures, but any sensible village headman was prepared for such a visitation, and in any case the inspectors were very careful and cautious in their approach. It was dangerous to accuse anyone if the case was to be tried before the judges. If the accusation proved wrong, the accuser paid the penalty which would have been paid by the accused if he had been guilty.

There was very little serious poverty in Inca Peru, and those in need were well provided for, but there was also very little self-reliance. The people had done nothing to make the Inca laws. The whole of the system which helped them to live comfortably was given to them from above. The wisdom of Inca laws was the wisdom of a series of all-powerful kings who had the good sense to listen to the advice of their Amautas whenever they were in doubt. Freedom? What was freedom in Inca Peru? Even the Inca was tied by inexorable law.

Within the law, and yet separate from the normal working of things, there was a class of people who lifted themselves out of the usual humdrum ways of life by special skills in healing and foretelling future events. These were more often than not wise women. They observed plants, animals and people, and learned what made them act in unusual ways. The changes in the weather could be prophesied in this way, but the words did not look like a weather forecast; the wise

woman would just tell the farmer which day would be the most lucky for him to do some special work. With illness, too, there was a great deal of good scientific observation of the effects of herbs, but no medicine was given to a sick person just as a scientific prescription; it was given with chants and drumming to drive out the spirits causing the sickness. This was good psychology, since the patient would recover much quicker if he was sure that his spirit was strengthened as well as his body. Then every improvement made by the medicine in the bodily comfort of the patient was felt as a strengthening of his mind also.

Sometimes lots were thrown with beans to foretell the future, and this could be controlled to some extent by the person who threw them. It was very different from the magic procedure of the priests who inspected the lungs of sacrificed animals, but to a superstitious people the presence of a medicine-woman in a village could be a great comfort. It was more homely than the great ceremonies of the formal religion in the town.

It may be that the Inca regulations made life too dull for many people, and that would explain the hold which coca chewing had over them. They all carried little woollen bags filled with the dried leaves of the coca shrub. If they worked very hard chewing coca helped them to keep up their energy. They forgot they were tired and just kept on. If they were hungry they felt comforted by the hazy stupor of the coca drug. Unhappily, too many of them took to this habit, and we hear of rows of porters sitting down with inflamed eyes and stupid faces chewing themselves into

insensibility until a shouted order brought them to their feet to carry their loads like a row of automata. Such drug-taking was not to relieve the pains of real want, for none need go hungry in Inca Peru, but to kill the misery of thinking. Many a *mitimae* must have dreamed of the people in the old home, many a young couple must have longed for the partners whom they really wanted to marry. Many a parent longed for the child taken from home to a higher education and social importance. Many an Inca must have longed to escape from the round of ceremonies. But from the endless round of things recorded in the knots of the quipus there was only one final cure, the peaceful days of old age, in which one paid no taxes and enjoyed freedom from the regulations. Coca chewing was only a temporary escape from unwanted truth, and it often led to ill health and early death. What a pity that the Incas could not give people freedom to live!

The only control of coca addiction seems to have been the pressure of public opinion. The same applied to drunkenness. At the great festivals the Peruvians drank too much. They were quite aware that they would stagger around and start fights between clan and clan; but all the same, they could not give up the idea of drinking their beloved *chicha*, which was simply a fermented maize beer. It was related to the maize spirits and so was holy, to be drunk in particular at the planting festivals of new maize. If a man committed a crime when drunk, he was treated more leniently, because it was not so much he who did it as the divine spirit which had got inside him. Apparently one of the

wiser Incas tried to experiment by using smaller keros of liquor at the planting festival, but the whole population of Cuzco objected and sang insulting songs about him. Next year the offering-vases of the precious drink were larger than ever before.

In other matters Inca law was terribly simple and strict. There were no prisons. Thieves lost their hands. Cheats and perjurers might have their lips cut away. To conspire against an official might result in loss of the tongue and lopping of ears. Speaking ill of the Inca was a capital crime, and the offender was strangled. Adultery was also punishable by death; the man was bound and thrown over a cliff, while the woman was beaten to death.

There was no appeal from the sentence of a judge, but the trials seems to have been very fair. If a false judgment was discovered the judge suffered the same punishment that he had inflicted, and lost his office. When a criminal was punished by mutilation so that he could no longer earn his living, it was considered that his condition was natural. In that case he would be supported by his community, and the amount of food and clothing he needed was remitted from the tax paid to the Inca. The Incas preferred to keep such criminals alive, so that other people should see their sad condition and be warned. The judgments were recorded in numbers on quipus.

In Huaman Poma's book, the Quipucamayoc stands by another counting device in which twenty squares are arranged in four columns; each vertical column contains either one, two, three or five spots. In each



*(Above)* The monolithic Intihuatana in the hill city of Macchu Pichu. This pillar was used for calculating dates, especially marking the day on which the sun passed vertically overhead at noon. *(Photograph: Everild Helweg Larsen.)*

*(Right)* A stone marker on Ccolcampata where the Inca youths competed in their examinations for knighthood before the Inca. *(Photograph: Mervyn G. Palmer.)*







Inca period stonework. (*Above*) The fortress walls of the Hawk's Nest, Sacsahuaman, guarding the road to Cuzco. (*Left*) A palace wall in Cuzco. (Photographs: Mervyn G. Palmer.)



The Centre of the Earth: the walls of Ccoricancha, the sun temple in Cuzco. One can see part of the Spanish church of St. Dominic above the rough surface where once the golden band ran around the building. The closer photo shows the wonderfully exact stonework of this most sacred building in all the Inca Empire. (*Photographs: Mervyn G. Palmer.*)





Small pottery vase with flower painting and a modelled puma head. The tiny loops at the neck were for holding a skin cap on the vase to prevent the contents from spilling. (*Photograph: Ferdinand Anton, Munich.*)

square there are black and white spots. This seems to be a reckoning device with great possibilities, since one can change the rhythms of the black and white something like a thousand times. It might be possible for us to work out the method of using this counting-board by a mathematical analysis. To the Peruvians it would have presented no difficulty. It was just the kind of thing which they habitually used in their weaving. When four colours are used in a weaving pattern they can be used in the same pattern in twenty-four different arrangements. A Peruvian weaver would be unhappy unless all these possibilities had been explored. It seems that the mind of the nation was quite naturally turned towards mathematics, and that the quipu records would seem as natural to their way of thinking as alphabetic symbols are to us. Numbers were of tremendous interest to them, and played a great part in their daily life, even coming quite deeply into their religion.

# 8

## THE SACRED HUACAS

**H**UACA IS a Quechua word which can be translated as "strange", "Holy", "mysterious", and a dozen other somewhat similar words. It applied to lucky stones worn in a necklace as much as to the golden images of the Inca gods. An ancient pot was "huaca", and so was the rainbow. In fact anything at all could be full of strange magic powers to the ancient Peruvians. They had lucky charms of all kinds, and watched the flight of birds to tell them what their fortune was going to be for the day.

The people did not think of a scientific universe in which everything was material. Their attitude was exactly the opposite; to them, everything had a kind of spirit in it. There were great beings full of power, such as the glorious warm sun and the ever-changing moon. The winds came like flying serpents spreading blessings or disaster according to their nature. Spirits slipped into stones and made them take strange forms. Little fairy-like beings among the flowers squeaked messages for those who could hear. To the Incas, the whole of creation was a wonderland in which mankind tried to find a way. But always helping them was the rainbow. The rainbow of many colours was a promise of rain

or sun for the crops; it showed all colours against the storm blackness in the sky, and so it became a special symbol of the Creator, Viracocha.

Some of the great beings of the past, it was believed, had been turned into rocks. The elder brother of the



A stone bowl and ancient pots all called Huacas by the Indian villagers

Incas, who had come from the Tampu Tocco cave with them, was turned into a column of stone and still remained only about six miles from Cuzco. He was always alive, and gave answers to questions through the mouths of the priests who attended him. Naturally he was the particular totem of his relatives, and most Incas asked his advice before they undertook any great new enterprise. But Huanacauri was quite capable of coming to visit his relatives, and often appeared to the Incas in dreams to warn them or to encourage them.

At first look all this seems a rather silly superstition,

but psychologists will tell you that dreams reflect much of your own unconscious thoughts about life . . . the things which you often forget to think about while you are awake. It seems that the Incas must have often seen the other side of themselves in visions while they slept, but instead of being frightened of the dark shadow they felt it was somehow related to them, and interpreted it to be their ancient friend, brother Huana-cauri, with a message for them. That Huanacauri usually gave very wise advice only shows that the average Topa Inca was a thoughtful man, and that within his mind he was unconsciously working out problems and getting sound answers.

You may have had those lovely dreams in which you float through the air without effort, or swim in a great sea of water which has no resistance. The ancient Peruvians had exactly the same kind of dreams, but they went out of their way to explain them by supposing that some good fairy had taken them to see what was happening far off while they were asleep. If these dreams showed them things which came true later on, they told their dreams and were looked on as being specially blessed by the gods. But there were also some very unpleasant little demons in Peruvian belief. They brought dreams which made people think they were breaking the laws. You have had dreams about finding yourself in some situation where you felt really shocked and shy, or those horrible dreams where one goes into a dark and frightening building, only to find oneself on the edge of a precipice, or—still worse—looking at a doorway beyond which lurks some dark thing we are

afraid to look at. You can well imagine what the simple Indians of Peru felt about such things. They were the product of their own minds, but they were not to know that, so they imagined that demons had taken their souls away to frighten them. Perhaps some of them realized that they were being warned that they were going towards a precipice in their life, or that they were refusing to face unpleasant things which they really ought to face up to.

Huaman Poma de Ayala shows a good many of the little spirits which the Peruvians believed in, but he has usually given them horns and a tail, as the Spanish missionaries had suggested to him. They pop up to answer questions from out of a magician's fire, or take offerings of drink from the Inca and fly on their bats' wings to give them to the sun. The native people often really thought of them as little devils.

One story tells of some young people who actually fell in love and told the town authorities that they should marry them, whether they were on the official lists of people to be married or not. This was completely shocking to the authorities. The young people were questioned and tortured. Eventually the boys confessed that spirits had flown down to them and given them little round transparent stones which would make the girls follow them wherever they wished. And sure enough when the girls were questioned each one was found to have a transparent quartz pebble in her possession. The Peruvians would permit love charms, but when it came to charms which made people question the wisdom of the authorities it was altogether too



much. The victims of this terrible magic were killed, and the little demons were banished from Peru by very great magical ceremonies in which even the Inca burned all the small huacas which he had in his personal collection.

However, the huacas were never away for long. In many ways they were the important gods to the ordinary people. The luck and bad luck of every day were the interest of the village farmers of Peru. The great magics of the changing seasons were well enough known to them, but they would never think of working out for themselves when they should plant or reap. The priests of the Sun gave the times for these festivals, and after the Inca had taken the first step every farmer in the country felt that he should do the same. They were not even very interested in the stars and planets, but preferred only to notice the moon when she was very bright and happy. They were afraid of the dark, and did not often go about at night. Even after a festival, if they were out late, they would wrap up in a warm piece of cloth and sleep in any doorway in the town rather than travel back to the village at night.

The official religion was much richer, but when we remember that the rock pillar of Huanacauri was a relative of the Incas we have to be prepared for very strange sights. Near Cuzco was a great rock, the Kenko stone, which looked roughly like a great puma. A puma was a dangerous animal when angered, so this great rock became linked in people's minds with the savage and brave nature of the puma itself. This in turn linked it with the warriors. So the Inca had a wall built

around the base of the stone and a space cleared in front of it, so that people could make offerings to the lucky rock on great occasions. The Inca himself poured out the offerings and led the chants to the puma spirits for victory.

There were many legends in Peru about people who had been turned into stone, or of gigantic animal-like creatures which had been similarly transformed by the first ancestors. If one asked about them, they would be pointed out among the rocks. Huaman Poma has drawings of the Inca making offerings to such rocks, looking like people at the top of great storm-weathered cliffs.

A very interesting discovery has been made over the last few years in a remote plateau valley in the Huarochiri Valley, about seventy miles inland from Lima. At this site—named Masma by Dr. Daniel Ruzo, who discovered it—there is a complex wall of hard grey limestone, under which a mass of volcanic rock had been thrust in past ages. This lava had burst out in rolling contorted forms, and cooled. Then in turn the shattered limestone had been weathered by the rains and frosts of the mountains. The result has been that the Masma Valley is surrounded by fantastic rocks, with cliffs and valley sculptured into great heads and faces, volcanic rocks like giant lizards, sudden outcrops of limestone like isolated castles with people at the battlements. This was too much for the Indians to let alone. They seem to have realized that these rocks were naturally to be classed as huacas, and at some early period they helped out the resemblances by touching them up here and there with a little sculptural work.

In the end the sacred place became so full of this mixture of natural forms and sculpture that at certain times of the day and on definite dates of the year the sun's rays fell at the right angles to emphasize the shape of one or other of the supposed figures of the ancient huacas. It was probably a place where the priests determined the calendar for the year by noting the days on which certain rocks received the first rays of the sun. Even now, when the people of the towns in the valley hold the festival of the patron saint of their church, they like to go half-way up the slope leading to this valley of the giants, and hold the meeting which has to organize the processions and ceremonies. They start the new year by coming down from the mountain to the town, just as happened in ancient times.

What gods were worshipped in this valley? At least they were important, because the mountains at the rim of the valley form the watershed between streams which end on one side in the Pacific at Lima and on the other side in streams which eventually reach the Amazon. We have a document written in 1608 by Father Francisco de Avila, in which he describes the ancient religion of the people in this Huarochiri Valley, and repeats a curious and sometimes funny legend about Viracocha in his form as Koniraya. Koniraya was a creator who managed to fall into ridiculous adventures from which he extricated himself by magic. He represented the trickster figure found in many primitive religions. The Indians of Huarochiri remembered him in connection with his chasing the goddess Cavillaca across the mountains, and his treatment of

the animals which helped or hindered him. If one checks off the legend and the figures in the rock it becomes possible to see the story pictured there. Of course one uses a lot of imagination, but so did the ancient people. To date there are no reports of pottery found near the "touched up" rocks in the Masma Valley. Possibly it was always as shown in the pictures by Huaman Poma de Ayala, where offerings were poured out from wooden keros, and not from pottery vessels.

Just as the sun illuminated different rocks in the mountain valleys at different times of the year, so it was used to check the seasons by skilled astronomer-priests in the Inca cities. There is hardly a town without its sun throne, Intihuatana, in all the Inca Empire. These thrones are really sundials used for measuring the days of the year rather than the hours of the day. It could only be an Intihuatana if observations were made at midday, because that was the only time that the sun sat on its seat so exactly that no shadow was cast on the two days in the year when it passed right overhead.

A people without clocks must have had some problems about time. How were they to make sure of the midday moment when they should measure the shadow of the sun? The only way they could tackle that problem was to watch a north-south line and notice when the sun crossed it. Exactly between sunrise and sunset, on the horizon, was the point where the north-south line touched the edge of the sky. For part of the year the sun was crossing the northern half of the line, and for part of the year the sun was crossing the

southern half of the line. One could mark these north and south points in the wall of the Intihuatana and so always have a useful check point.

As the last days of the Incas approached, and the empire extended from Quito on the Equator down to



Architects examining stones for an observatory

the Chilean desert at the Tropic of Capricorn, the Inca sun priests must have noticed that at Quito the sun was twice overhead on March 21st and September 21st, six months apart, while in the southern borders of the empire it was only once overhead, on December 22nd. In between came Cuzco, where the important sun ceremonies came as Inti passed overhead in the middle of October. Because this was the homeland of the Incas, the great sun festivals of the whole empire were linked

with the festivals observed at Ccoricancha in Cuzco. In other parts of the empire the Intihuatanas could have served only as means of checking the calendar by the length of the midday shadow cast by the central pillar of the dial; but in Cuzco there were sixteen pillars erected on the skyline visible from the Intihuatana, so that the progress of the seasons could be properly recorded.

The special sun festival of the Inca family was the June solstice. The sun was farthest away to the north. There were moments of anxiety; perhaps the god might continue his journey and not return as he usually did. However, as the sun rose on the next morning he would shine into the doorway of Ccoricancha as usual. The Topa Inca and the Villac Umu would be there by the altar. The High Priest would hold a concave metal mirror to focus the sun's rays on a bunch of fibre. The concentrated heat would set it alight, and the Inca would give the new fire to his people.

For the ordinary people the Lady Quilla gave her changing light as the moon. Moons were numbered from the June mid-winter festival, and at every new moon there was a little ceremony. The calendar of the year was kept by moons, and of course the priests had to adjust their sun calendar for every festival so that the correct sun date should be fitted to the lunar cycle of twenty-nine and a half days. Each year a given festival would fall approximately eleven days later by moon time. If the June solstice fell on new moon one year, it would be on the eleventh day of the moon on

the next, and so on. The priests must have been thankful that they had been trained in mathematics.

As well as being moon and sun watchers, the priests kept an eye on the stars. They knew as well as any modern astronomer that the stars keep better time than anything else. One can check the calendar very exactly by noting which stars were on the horizon at sunset and sunrise each day. In the clear mountain air of Cuzco this was comparatively easy; so a star calendar was used, and stars held their proper place in the golden wall of Ccoricancha. Between the stars moved mysterious birds which we should call the planets. Their movements were very carefully checked, especially the wonderfully brilliant little sun, the planet Venus, which was counted as two beings, the Morning Star and the Evening Star. We have no record of what powers were ascribed to the stars and planets in ancient Peruvian astrology, but we may be sure that the people of the Inca Empire were not at all behind other races in believing that they could read their fates in the stars.

However, the religion of the Incas was by no means just an astronomical fable. There was a quite definite set of stories behind their beliefs, and these had some moral purpose within them—a kind of poem about the creation of the world and the appearance of the first humans. It was a system of belief in the Creator and his dealings with humans. If the beliefs about the origins of the mountains and rivers and the reason why the animals had their various markings were often absurd, it was no more so than with other primitive beliefs. Mankind demands that the gods should be

responsible for every detail of creation. The Sun was father of the Incas, and Lord of Gold, but he was entirely subservient to the greater power of the Creator, Viracocha.

The stately dance of the sun, moon and planets in the sky was never just a great machine of the Peruvians. They saw it as the movement of living beings which were concerned with the affairs of earth. In everything they felt that man and the world of Nature were interlinked. This linkage in the mind is certainly much older than Inca times in Peru. On the coast near Nasca there are some rocky hills on which men made great figures of flying birds, associated with straight lines which appear to have reference to some astronomical bearing. We have no doubt that the birds represented the planets; so at least six centuries before the Incas there were astronomers in Peru who were so enthusiastic that they laid out their work in boulders carefully placed on the hill tops in a pattern so big that it cannot be seen visually on the ground. This was only discovered from aerial photographs. How such a thing could have been planned, since the people making it could never have seen the whole design, is quite a problem. A guess would make the original pattern a piece of tapestry, because the shape of the birds is exactly the shape of birds in Nasca tapestries. If one took a measurement of one pace of about twenty inches for every thread in the tapestry shape, the result would be that a bird four inches wide on the tapestry would be expanded to about one hundred and twenty feet. Yet it would need a very skilled man to lay out such a



design without being able to see how well he was working. He had no aeroplane, as we have, to see the perfection of the designs he made. Since the figures contain no recognizable bearings within themselves, it is likely that they were placed among the stone alignments of the observatory simply as an offering to the planets. Perhaps the planners wished to show them their own images to make them pleased with mankind.

However, the astronomers and the great lords of the Incas were all at one in the end; they faced the road to death with hope. From ancient vases one sees that there was a land of the dead in which the skeletons of the departed Peruvians danced and sang for joy. There was a great willingness among these people to accept the happenings of fate. If things went wrong in life there was no resentment. One was simply moving with the stream of fate. When death came, it was for the survivors to weep for the loss of one whom they had known so long. For the dying person there was the warm hope of descending the dark pathway, and then, after breaking away from this world, to enter the land where one could meet all the friends and relatives who had passed on before.

There was a strong belief that the dead sometimes appeared on earth; sometimes in dreams to warn or advise their relatives, but sometimes, too, as apparitions. Ghosts were not very popular. People were afraid of them and felt there was something wrong with a person who wanted to come back to this earth, where the passing of time made it but a place of sorrow. Better that the invisible should return in a dream, like

the visits of the dead Incas to their own mummies at the feasts held in their honour. Nevertheless, they expected that one day they would all be reborn to come to live on earth again. Of course, this was for people who had lived well and done their duties to their neighbours. For the evil-livers there was no particular hell, but utter destruction. For them no sun, no flowers, no drinking and dancing—just nothing, nothing at all. So one hoped not to be among those who were lost.

We do not know how these people fared, but we do know that their history records many brave and noble lives. As for their discarded bodies, few have survived in good condition, and many of these have been taken away to repose on the shelves of museums. It is always a little sad to see the quiet bodies wrapped in their fine clothes, awaiting a new life; so patiently they seem to sleep there, just waiting.

# 9

## THE END AND THE BEGINNING

LATE IN April 1532 the Spaniards under Pizarro landed at the port of Tumbez. There were one or two minor skirmishes, that was all. After two weeks, Pizarro gathered his little army together and went on an exploring journey. At the beginning of June he decided to settle at San Miguel de Piura, as he named it, a pleasant valley town beside a river which opened into the Pacific. If needed, ships could come from Tumbez to assist him or evacuate the army. But nothing whatever happened; the local people were friendly and happy, and flocked to meet the strangers and exchange presents; although they did not understand they listened to the proclamation that their country was now part of the dominions of the Emperor of Spain.

On September 24th Pizarro decided to leave San Miguel. He had sent a good supply of gold home to Spain, but his men were spoiling for some kind of action. Fifty of them stayed to garrison San Miguel, and the rest, less than two hundred, set out to conquer the empire of the Incas.

At Caja they sent Hernando de Soto to visit an Inca chieftain who was near by. Again for ten days nothing

happened; then De Soto came back with the Inca general and a load of presents carried on the backs of servants. With it came a message from Atahualpa Inca that he would welcome the Spanish visitors if they came across the mountains to see him where he was encamped at the warm springs beside the town of Caxamalca. Pizarro accepted the invitation, and sent back presents for Atahualpa. Already the Spaniards had heard a good deal about the war in which the prince of Quito had conquered the lord of Cuzco. It seems that they had no conception of the rights and wrongs of the case, and did not attempt to represent themselves as the friends of Topa Inca Huascar. Hundreds of members of the Inca family, perhaps thousands, had been killed by Atahualpa. He had determined that there should be no opposition to his rule from any of his jealous relatives. He kept Huascar in prison apparently for the purpose of making him feel his unhappy position all the more keenly; but the Spaniards knew only that they were faced by a great leader of armies who had overthrown a rival for the throne and was now enjoying his victory with his soldiers around him. They had good reason to feel nervous about the outcome of their visit to such a mighty king.

The people of the coasts had supported Huascar in the war, but had accepted defeat. It may well be that they did not resist Pizarro because they felt that he would in any case revenge the captivity of the Topa Inca. But why Atahualpa made no move for five

months, even when the Spaniards took over control of towns and seized the supplies of sacred gold, we do not know. Perhaps he knew he could crush such a small body of bearded white men whenever he wished, and was just waiting to celebrate the purification festival in the October moon, when he would cleanse the land of invaders in the same way as any other pestilence. Or perhaps he recognized the magical meaning of a new visitation of white men with beards as a message from Viracocha, and relied on his influence with the god, who after all was a relative, to have them adopted into his service, thus making him still greater. We shall probably never know exactly why Atahualpa calmly waited for his visitors to come to him.

The Spaniards advanced rather cautiously. When they came to the difficult passes through the mountains they expected to be ambushed at any moment; they knew they were in a position where nothing could save them if there were a determined attack from the higher ground on all sides of the winding trail. But no; nothing happened, and as they rode on to the plateau they found they were approaching a wonderful paved road, far finer than anything they had seen in Spain. In the distance were more mountains with snowy peaks. A river led through the plain, and far away they could distinguish a cloud over the hot springs. They approached through increasing numbers of villages towards the city, and then they saw the camp of the Incas. Tents and bivouacs covered a vastly greater area than the city. Half a million warriors or more were there. The Spaniards knew in their hearts that they

were walking into a trap, but Pizarro calmly accepted the situation and pressed on.

On the evening of November 15th Pizarro entered the city of Caxamalca. The Inca received him in near silence, explaining that this was a fast day before the festival on the next day. He assigned buildings in the town to be occupied by the Spaniards. At last Pizarro felt that he had stone walls around him, and when he left the Inca that night his plans were ready. The stone houses would form a base for the Spaniards. As the Inca entered the great square of the city the horsemen would advance on both sides to welcome him. Then the arquebusiers would advance to cover the retreat as the Inca was seized and made captive.

The plan was near enough insane, but it was literally the only chance the Spaniards had to remain alive and extricate themselves from the trap. It was as if a fly should plan to escape from the spider's web by eating the spider.

On the morning of November 15th, 1532, the Inca Atahualpa was seized in the midst of the greatest nobles of his empire and a great part of his army. The appearance of horsemen, something never seen before by the Inca army, and the thunderous crash of the clumsy arquebuses demoralized all opposition. Although the Inca soldiers made a brave rally, the square gave them no room to manœuvre, and they were cut to pieces by repeated charges of the armoured Spaniards, who were immune to the blows of the bronze-headed maces of the Peruvians. The slaughter was terrible, and

in the end the Inca remained a prisoner of his reckless opponents.

The captivity of Atahualpa Inca was not made hard. He was kept within the palace at Caxamalca, but allowed to have his officials visit him, and his favourite wives stayed with him. During this period Pizarro visited the great temple of Pachacamac and destroyed the old wooden idol. In its place he set up a cross on top of the great brick pyramid. The priests had hidden away a great deal of the gold from the temple, but Pizarro took a rich booty all the same. Then he found out about Topa Inca Huascar. He returned to Atahualpa and demanded an explanation of events, thinking that he should be able to control the country by playing off one faction against the other. But next day he heard that Huascar had been killed by drowning.

Atahualpa had summed up the Spaniard very well, and explained that it was not by his orders that Huascar had been killed, but by the mistaken hurry of his soldiers. Meanwhile he offered to pay a ransom for himself in gold, which should fill the chamber he was in as high as a mark nine feet up on the wall. Pizarro accepted.

Three soldiers were sent to golden Cuzco to command the stripping of gold from the palaces, and Ccoricancha, for the ransom of Atahualpa Inca. From Ccoricancha came nine hundred plates of gold as big as the lid of a wooden chest. The mummies of the dead Incas were left. As the commissioners returned with their loads, news came of the landing of more Spaniards. Atahualpa felt that his fate was sealed, for now

there were more enemies come to demand gold. He saw a bright comet in the sky, and told his attendants that he must die soon. The Spaniards said that from that hour he became quiet and serious as if preparing for his end.

It soon happened as he expected. The Spaniards wanted to divide the treasure before all of it was delivered. Then, amid their own quarrels, they heard of the massing of Inca armies around them. The treasure in their hands was worth about twelve million pounds in present values.

Atahualpa quietly demanded his freedom. The Spaniards decided they must hold him longer. Rumours of the Indian rising grew, and Atahualpa was put in chains. A trumped-up charge was made against him, even though some brave men dared to say that the Inca who had treated them so well should not be murdered. The sentence, however, was that he should be burned alive. Atahualpa broke down at this, but the Spaniards told him that if he would consent to be baptized they would only strangle him with the garrote. Atahualpa accepted this grotesque mercy, and died quietly and peacefully. The date was August 29th, 1533.

The next Spanish move was a five-hundred-mile march to Cuzco. The Inca Empire was falling into ruins all around them. The outlying provinces revolted, and started to fight one another. The home organization broke down. Some sections of the army remained in being and harassed the Spaniards, but the great general Chalcuchima was caught and burned alive; he died

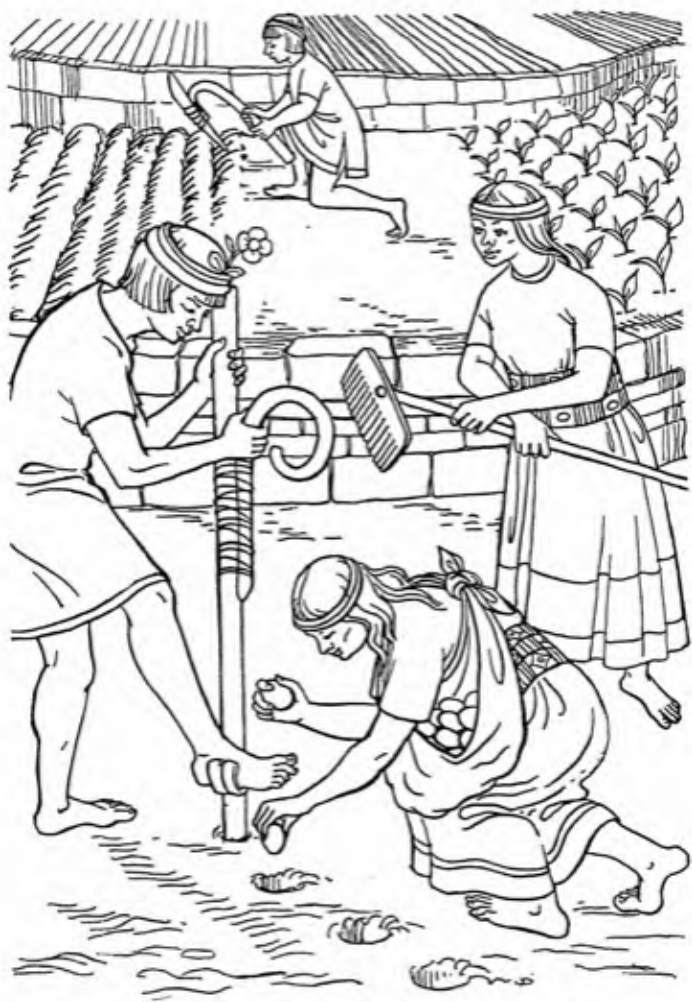


laughing at them and calling on Pachacamac. Later history looked as if his wish for revenge was gratified.

On November 15th, 1533, Pizarro entered Cuzco. The army noticed the wonderful building of the great Sacsahuaman fortress and the round tower for water storage in the centre, of which the foundations have only recently been discovered. They saw the rows of palaces facing the narrow street and noted that the doorways were brilliantly painted. But there was still gold in Cuzco; and in spite of the order to preserve the ancient city, the troops burst into the palaces and temples to loot everything they could find. Later they robbed the ordinary houses, and sought out the graveyards, where they turned the mummies out of their vaults and stripped them of their rich ornaments. Caves in the hills were searched for treasure, and then the whole mass was piled in the great square of the city and divided up. Another three or four million pounds' worth of gold was taken away, and Golden Cuzco was left desolate to become a provincial Spanish town.

The fantastic destruction of the Inca Empire continued all along the line. The Spaniards found that all organization had broken down, and they were faced with the problem of re-creating some sort of order within the country. But it was only with the help of local governors and Quipucamayocs that they were able to rebuild enough of central government to carry on.

The Spanish version of the feudal system fitted the situation quite well. Leading Spaniards were given towns with the land belonging to them. They appointed



The Peruvian villagers working in their fields

the officials of a town council, and saw to it that the Indians living on the land brought in material as it was needed. They did not know that in most cases it was less than the Incas had demanded. They continued the old system by which every town was responsible for the roads and bridges leading to it, and then they started to decide who was entitled to the greatest honours in this new country which they had seized. One after another they plotted and rioted in attempts to seize power. The fiercest contestants were Almagro and Pizarro, the two men who had done most to win the country for Spain.

In the midst of this, Manco, the young heir to the Inca throne, was stung to revolt. Silently he organized a resistance movement, and then when the time was ripe he assaulted the city. The place was set on fire. For four days the blaze continued; Peruvian warriors wrecking in despair the palaces of their ancestors. Only the great buildings near the centre of the city survived. The Spanish garrison fought back bravely, and withstood a siege of five months, every day with some outbreak of bitter fighting; but in the end harvest time came, and the Spaniards awoke to see that the enemy army had almost disappeared overnight. The farmers had preferred to go home to reap their crops to feed their families. The Empire of the Incas was finished so far as they were concerned.

Inca Manco ruled a while from the mountains, but he was hunted down. Meanwhile the conquerors became more and more involved in their personal hatreds and at last the whole unhappy business broke out into

a series of civil wars. Eventually the Spanish Government intervened, and sent the Viceroy Mendoza from Mexico. Though he only lived a few months, he brought peace and order to the country, and arranged for the honourable burial of the remains of Pizarro and Almagro and the other *conquistadores* who had killed one another in the civil wars.

The rule of Spain in her colonies was far more enlightened than that of any other country of Europe, even over their own citizens. The development of Peru was hindered by terrible epidemics of plague and fevers, but gradually the country came to its feet again. It was already rich and prosperous with many newly built towns in 1600. Then all the original conquerors were gone to their graves, and people remembered them as turbulent heroes of another, more brutal age. The Incas remained. No Topa Inca was left, but seven hundred Inca nobles lived in Peru with the rank of Spanish noblemen. They came to the Viceroy's court in their own national costume wearing beautiful Inca embroideries. For another century this tradition remained, and there are some portraits of a few of these nobles as late as the early eighteenth century still wearing the traditional dress of the Children of the Sun.

Slowly and gently the remains of Inca Peru grew into Spanish Peru. Cuzco was partly rebuilt, but was never again the capital. The old temples were gone, but the Inca roads were used, and Indian peasants tilled the fields, or became servants on the great Spanish estates. Along the coast the Chimu potters went on making pottery in the ancient way. Instead of the Morning Star

being seized by the Sun Puma, they modelled Christian martyrs being seized by curly-maned Roman lions. Their knowledge increased so that they began to use green glaze over the ancient pots. But the change was so gradual that there are many amusing archæological problems left to be solved which illustrate the very slow changes in the way of life of the Peruvian Indians.

Later in the eighteenth century, Spain fell upon bad times, and the colonies were bled of all their resources to pay for the wars in which the country was involved. At last, when the Napoleonic wars in Europe gave the opportunities, the first stirrings of revolt broke out and then Peru followed the flag of the liberator Bolivar and declared her independence.

The road to freedom was a hard one, and the busy commercial life of the nineteenth century separated the Indians of the highlands still further from the townsfolk of the cities. But as prosperity returned, so the unity of the new Peruvian people was steadily built up. A new respect for the wonderful past of the Indians as well as for their modern music and folk-lore has begun to bring them once more into the world of high culture. Many a Peruvian poet is now writing verse in the old Runa Simi, or Quechua language. In a sense which they never imagined, the Incas are returning to their ancient land. The archæological record is enlightening the modern life of the people.

We are all, to some extent, heirs to Inca Peru. The Incas left us invaluable gifts in the potato for food, quinine for medicine and alpaca for clothing. Their sense of colour and design influence many modern

artists, and their ancient songs have been echoed knowingly by modern composers. One must remember that nice little animal whom the Incas called Cui Cui. If you want to know what the little Cui Cui has done for humanity, ask any doctor how the guinea-pig has helped modern medical research. The nutria, whose name is so well known in the fur trade, is another Peruvian animal. Among the flowers we have the colourful petunia and the fuchsia from the Peruvian mountains. There is not very much gold now from Peru, but silver, tin, lead and zinc come from the mines, and copper is produced in great quantities. Near Nasca, seams of coal have been developed, while the water power of the rushing mountain streams has now begun to provide electric power for a Peru which promises to become a land richer than the Incas ever dreamed.

## EPILOGUE

WE HAVE looked at another ancient civilization, and found out some more things about it which we did not know before; but we have not kept strictly to archæology—we have called in other sciences to our aid all along the line. When we looked at the Inca gods we found that the psychologists could help our enquiries. When we considered the balsa rafts, we found that navigators had interesting advice to give us. We were puzzled for dates and found that the physicists could tell us about carbon-14.

To be a successful archæologist nowadays, it is not sufficient to provide just a detailed plan and sections of an archæological site, together with everything that was found in it. This is all very interesting, and may lead to valuable discovery, but how much more important it becomes if we gather together a team of experts to examine our material and report upon it. New ways of looking at the same thing bring out new aspects of value.

In the Peruvian field we are not lacking in examples of this kind of thing. For one example we can look at the teeth of the Peruvian mummies in a museum. Some of them have inlays of gold and turquoise. What a

difficult ordeal it must have been to have one's teeth scraped down to take an inlay! Probably they deadened the pain with coca leaves, and worked while the great warrior, who wanted such a fine decoration, slept under the drug. Some of these teeth were submitted to dentists in Sweden, who examined the dental cement used. It is still as firm today as it was when new. The basic cement contained mercuric oxide in small quantities. This is poisonous unless strictly controlled in small amounts in safe places, but it is used also in modern dental cements. In a few days careful research it was proved that the ancient Peruvian dentists had also conducted careful research with such good effect that they were able to use poisonous substances for the good of their patients.

Another piece of research on the microscopic structure of metals was conducted on an ancient Peruvian copper ball. The joint was proved to have been welded. Working with a blow-pipe on the metal heated in a charcoal fire, as we know the Peruvians did, it is almost impossible to weld copper. The metal oxidizes and burns away before it melts. The answer appears to have been that the joint of the ball was buried in close-packed powdered charcoal, which absorbs the oxygen, and so the craftsman was able to heat up a tiny portion at a time for welding in safety. That single specimen is a proof of the almost incredible technical skill of Peruvian metal smiths.

Weaving was one of the special skills of the ancient Peruvians. Using a simple back-strap loom, the weavers could reproduce all the techniques for which we



construct elaborate mechanical looms. An examination of some of the fabrics to find out what dyes were used proved that the people of the hot coastlands grew natural cotton in two colours; one white, and the other pale green. It may be that the coloured cotton plant was at first a natural "freak", but at least someone in the past noted that green cotton plant, and carefully bred from it so that there were sufficient plants for the weaving industry of the coastal towns.

On the other hand, researchers sometimes take most unusual lines to find out unexpected things for the sake of purely modern knowledge. Several Peruvian mummies are now being examined to determine their blood groupings. Little sections of desiccated muscle are being taken and gently teased apart in distilled water. In some of the bigger muscles there are dried-up blood vessels with some of the blood cells still intact. These can be examined microscopically and subjected to reaction tests which yield a reliable estimate of the blood group of the individuals examined.

So archæology is continually opening up new wonders, because it can be brought into line with all the other sciences. It always holds an interest for the future—even for the politician, who can prove or disprove theories from the study of what happened under the Inca system of complete control of daily life of the whole population. It can also warn mankind by showing the destruction caused by past wars, or by neglect of the food crops, or still more importantly by neglect of the drains and the consequent ravages of epidemics. The archæologist can show how the climate of our earth

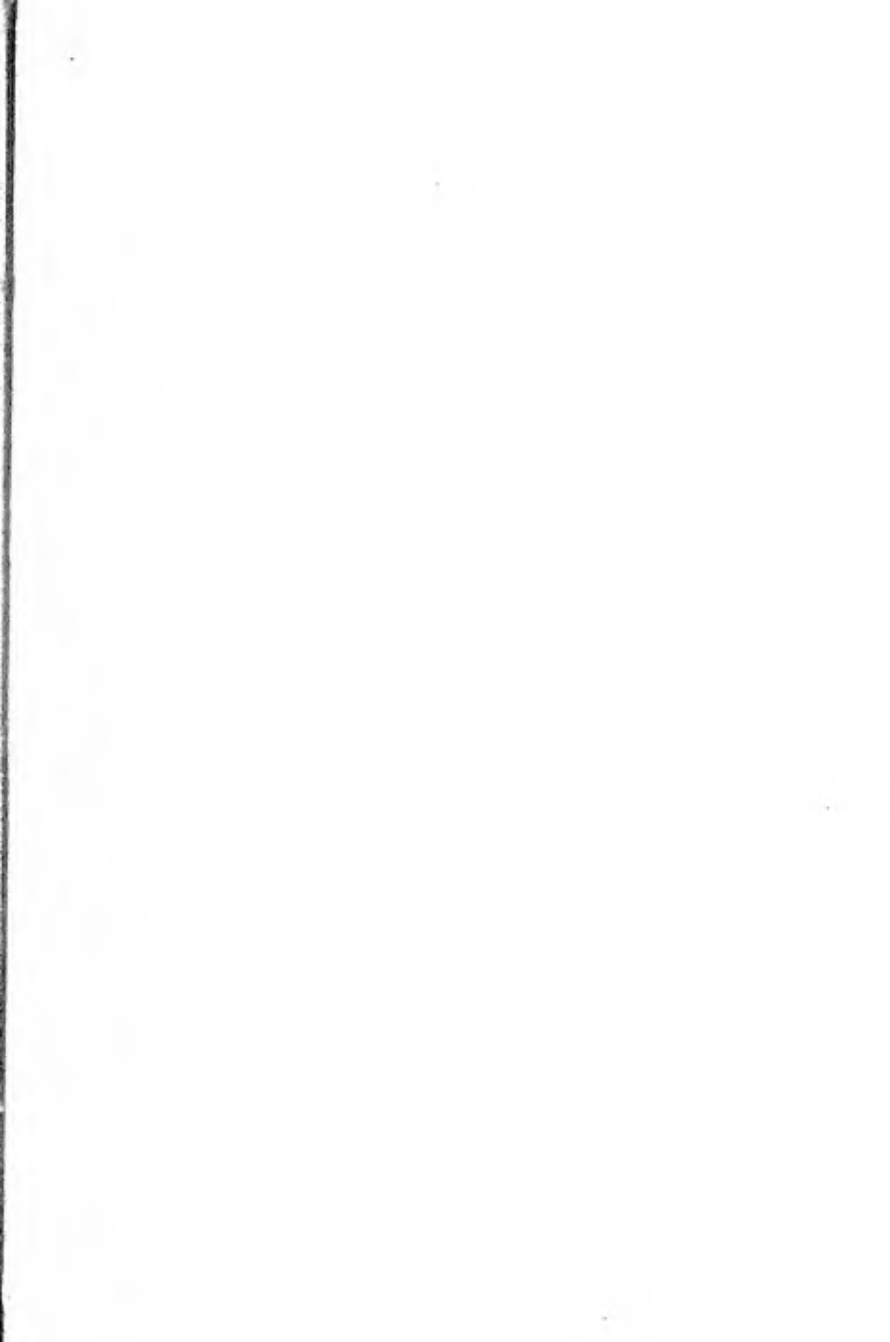
has been changing in the last few thousand years, and how mankind has adapted to changing circumstances. He illustrates the words of the historians, proving them or disproving them with complete impartiality. Yet it remains the most human of the sciences, because it reflects the way people have lived, what they have made for themselves, and what they have believed, over the thousands of years of human development.

Eventually our own times will become the subject of archæology. It is surprising how rapidly we slip into a forgotten past. The archæologist is always being surprised by such things. There was the curious case of the bottle dredged up from a backwater of the Medway which went to three museums before someone realized that it was a Victorian ginger-pop bottle. It is funny that such a thing can happen, but it is also very interesting that something less than a century old was of a shape which we had almost completely forgotten.

Another archæological joke came from an ancient barrow on Salisbury Plain. Quite deep in the mound a piece of flattened laminated iron was found. It was a problem to the people who found it, since iron should not have been found there; so they sent it up to a great expert in London. He was an elderly man and at once recognized what this strange mass of iron plates was. He asked the laboratory experts to treat the metal and unfold it. Thereupon he asked the young archæologists to come up and look at it. It was a crushed bicycle lamp! Probably it had been dragged down deep by a rabbit half a century before; but it was already archæology. The scientist had used such a lamp when he was

a boy, so he recognized it—but would you know a bicycle lamp of 1890 even if you saw a complete one in good condition?

As we slowly find that our own world is changing, and that our own past is becoming archæology, we can reflect that there will be much of interest in what we leave behind us for the men of the future to discover. I wonder how they will think of us in comparison with the brave old Incas of Peru?



Col-  
15/6/2175

*"A book that is shut is but a block"*

**CENTRAL ARCHAEOLOGICAL LIBRARY**

GOVT. OF INDIA  
Department of Archaeology  
NEW DELHI.

Please help us to keep the book  
clean and moving.